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ORANGE COUNTY
OC Public Works

MEMORANDUM

To: Orange County Planning Commission

From: OC Development Services / Planning

Date: September 17, 2020

Subject: Update to Planning Commission Agenda Item No. 1 For September 23, 2020 Meeting

Attached and outlined below are additional edits made for clarification purposes to the Guidelines for Evaluating VMT and the General Plan.

Document	Page Number	Reason for edit
Guidelines for Evaluating VMT Under CEQA (September 2020)	7	To explicitly provide applicants the flexibility to provide substantial evidence to support any variations to the baseline, such as a change in region for VMT analysis
Guidelines for Evaluating VMT Under CEQA (September 2020)	27	To clearly delineate project induced growth versus net project effect by creating two separate paragraphs
General Plan – Growth Management Element*	XI-10	Minor edit to correct title of "Transportation Implementation Manual"

*Document is an attachment in the Planning Commission Staff Report dated August 26, 2020

It should be recognized the use of Orange County as the region defines the comparative (i.e., baseline), or the denominator, in the identification of project-related impact. The numerator is the project's VMT contribution. The project-related/generated VMT profile may go beyond the county boundary and not be truncated by a jurisdictional boundary. For example, a new, large land development proposed near Orange County's eastern boundary may include VMT from as far away as Corona or other communities in Riverside and San Bernardino counties. In that case, it would be the responsibility of the applicant and their traffic study preparer to include the project VMT, regardless of geographical limit, to the satisfaction of the County staff. This project-related VMT profile would be compared against the County regional baseline.

Unlike delay-based LOS analyses, VMT is a regional effect not defined by roadway, intersection, or pathway. The OPR acknowledges this in its TA (page 6), which states,

> *Lead agencies should not truncate any VMT analysis because of jurisdictional or other boundaries by failing to count the portion of a trip that falls outside the jurisdiction or by discounting the VMT from a trip that crosses a jurisdictional boundary.*

Table A is used as the current 2020 calculations to demonstrate what calculations should be applied. Tables 2, 4, and 5, in Table A identify the relevant VMT baselines for the region. These baselines will be revised as the OCTAM is revised beyond version 5.0. Applicants should use the most up-to-date version of the OCTAM in setting the baseline and analyzing their project.[2]

[2] ~~The County strongly recommends that the entire Orange County region be used as the baseline to analyze proposed projects based on the substantial evidence provided herein. However, as~~ CEQA allows variances to the baseline ~~may~~ to be presented as part of the methodology for review and approval to the County by project applicants pursuant to CEQA Guidelines Section 15064.3(b)(4). Such alternate baselines must be supported by substantial evidence as defined by Section 15384(b) of the CEQA Guidelines.

The threshold for significance for a capacity-enhancing roadway project or new roadway project is any additional VMT generated by the project either due to the increased roadway use or as a result of induced growth attributable to the project.[7]

[7] Overall new roadway projects are general capacity-enhancing. However these project may show a short-term VMT reduction due to intervening paths or reduced travel times.

Long-term effects may include induced growth due to more desirable travel opportunities and/or increased land development and new trip generation. The net project effect takes into consideration the changes in the whole system as opposed to what happens on the proposed facility in question.

The County maintains over 1,060 lane-miles of unincorporated roadways.

vulnerable residents, and boost our economy by prioritizing co-located jobs, services, and hosing.

3. TRAFFIC LEVEL OF SERVICE POLICY

It is the policy of the County that within three years of the issuance of the first use and occupancy permit for a development project or within five years of the issuance of a finished grading permit or building permit for said development project, whichever occurs first, that the necessary improvements to arterial highway facilities, to which the project contributes measurable traffic, are constructed and completed to attain Level of Service (LOS) "D" at the intersections under the sole control of the County. LOS "C" shall also be maintained on Santiago Canyon Road links until such time as uninterrupted segments of the roadway (i.e., no major intersections) are reduced to less than three miles.

Intersections exempt from the above paragraph include facilities under the jurisdiction of a city or the State or those included on the Deficient Intersection List established pursuant to this Element. However, it is the policy of the County that all development contributing measurable traffic to intersections on the Deficient Intersection List shall only be approved if the development project contributes on a pro-rata basis to a Deficient Intersection Fund.

The "County of Orange Growth Management Element Transportation Implementation Manual" which was adopted by the Board of Supervisors in June 1989 and, as may subsequently be amended, establishes the procedures and local parameters for the implementation of this policy. Amendments to the manual shall be approved by the Board of Supervisors only after a public hearing. Since then, the Transportation Implementation Manual was deleted from the County of Orange General Plan Transportation Element and serves as a stand-alone "2020 Updated Transportation Implementation Manual".

4. VECHILE MILES TRAVELED POLICY

Statewide implementation for SB 743 began July 1, 2020. SB 743 changed the way transportation studies are conducted in CEQA documents. Vehicle miles traveled (VMT) replaces motorist delay and level of service (LOS) as the metric for impact determination. For land development projects, VMT is the product of the daily trips generated by a new development and the distance those trips travel to their destinations. For capital projects, impacts are identified as the new VMT attributable to the new capital project, both from the installation of the facility and the induced growth generated as a result of induced land use.

The "2020 Updated Transportation Implementation Manual", which was

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ORANGE COUNTY
OC Public Works

MEMORANDUM

To: Orange County Planning Commission

From: OC Development Services / Planning

Date: September 11, 2020

Subject: Planning Commission Agenda Item No. 1 For September 23, 2020 Meeting

At the August 26, 2020 Orange County Planning Commission meeting, the Planning Commission continued Item No. 2 (General Plan Amendment GPA 20-01 Land Use, Transportation and Growth Management Elements) to September 23, 2020 to provide various stakeholders with additional time to review the County's Guidelines for Evaluating Vehicle Miles Traveled Under CEQA (August 2020) (VMT Guidelines). The VMT Guidelines was included in the staff report and a continuation request was made by representatives of Rancho Mission Viejo (RMV), the Building Industry Association of Orange County, and the Development Processing Review Committee. This memorandum updates the August 26, 2020 Planning Commission Staff Report (Attachment 1).

On September 2, 2020, OC Development Services and Infrastructure/Traffic Engineering staff, along with County Counsel and LSA Associates, Inc., followed up with stakeholders to address questions and concerns related to the VMT Guidelines. Below are the questions posed by the stakeholders and responses provided by staff.

1. Question: Can the County's Guidelines be revised to allow applicants the opportunity to provide substantial evidence to support another regional boundary or baseline, rather than utilizing the proposed County region?

   Response: The Governor's Office of Planning and Research Technical Advisory (OPR TA) dated December 2018 does not explicitly define the region and allows the Lead Agency to define a region as a baseline for the Vehicles Miles Traveled (VMT) analysis. Using the entire County as the region is a conservative approach, since the majority (approximately 88 percent) of the unincorporated county trips are contained within the entirety of Orange County and many other large urbanized areas are defining their region as the county. Baseline VMT also takes into consideration the Countywide average. The use of the entire County as the region defines the comparative (i.e., baseline), or the denominator, in the identification of project-related impacts. The numerator is the project's VMT contribution.

   At this time, the County does not intend to define additional regions (such as Supervisorial Districts, water districts, or geographical areas such as Northern Orange County, Coastal Orange County or Southern Orange County) for VMT analysis. If the applicant wishes to depart from any of the County's proposed VMT Guidelines, the applicant may do so, but must provide substantial evidence to support their assertion that an alternate region/baseline is more appropriate for their project to the satisfaction of the County.

   For additional clarification, staff added language to the VMT Guidelines in Section 2.0 (Definition of Region) of Attachment 2 to explicitly allow applicants to provide substantial evidence to support any variations.

2. Question: Please confirm whether the 500 or fewer average daily trips (ADTs) threshold is derived from the Draft South Coast Air Quality Management District (AQMD) document.

   Response: Yes, the 500 or fewer ADT threshold was derived from the Draft AQMD document dated December 5, 2008.

3. Question: Please clarify the difference between induced growth and net project effect.

   Response: Overall, new roadway projects are generally capacity-enhancing. However, these projects may show a short-term VMT reduction due to intervening paths or reduced travel times. But long-term effects may include induced growth due to more desirable travel opportunities and/or increased land development and new trip generation. The net project effect takes into consideration the changes in the whole system as opposed to what happens on the proposed facility in question.

   For additional clarification, staff added language on induced growth and net project effect in Section 5.0 (Significance Thresholds for Transportation Projects) of Attachment 2.

4. Can applicants use Level of Service (LOS) for subsequent environmental review after a Program Environmental Impact Report (PEIR) has been certified and not require VMT analysis?

   Response: Upon the review of any future projects, the County will apply Public Resources Code Section 21166 to determine whether VMT analysis is required. Absent of any facts or legal requirements to the contrary, the County will not require VMT analysis on any previously approved environmental documents.

   For additional clarification, staff added language in Section 1.0 (Introduction) of Attachment 2.

5. Will LOS continue to be a metric used by the County since VMT is the only required transportation analysis to be included in CEQA documents?

   Response: Yes, LOS will continue to be utilized by the County to ensure adequate public infrastructure is consistent with the County's Transportation Implementation Manual, and to determine traffic impacts for operational level assessment, as appropriate.

Also, OC Public Works/Infrastructure requested additional edits under Section 3.2 (Project Screening/Transportation Projects) to address projects that are consistent with the Orange County Master Plan of Arterial Highways network.

Attachment 1: Planning Commission Staff Report dated August 26, 2020
Attachment 2: Additional redlines to the County's Guidelines for Evaluating Vehicle Miles Traveled Under CEQA (September 2020)

Attachment 1

ORANGE COUNTY OC Public Works

ITEM #2

DATE: August 26, 2020

TO: Orange County Planning Commission

FROM: OC Development Services/Planning

SUBJECT: General Plan Amendment 20-01 - Land Use, Transportation and Growth Management Elements

PROPOSAL: Consider for Board recommendation an amendment to the County of Orange General Plan Land Use, Transportation, and Growth Management Elements to incorporate new metrics for California Environmental Quality Act transportation analysis to ensure compliance with recent state mandated changes and adoption of Guidelines for Evaluating Vehicle Miles Traveled Under CEQA (August 2020) and the 2020 Updated Transportation Implementation Manual.

ZONING/ GENERAL PLAN DESIGNATION: N/A

LOCATION: Unincorporated Areas of Orange County

APPLICANT: OC Development Services

STAFF CONTACT:

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RECOMMENDED ACTION(S):

OC Development Services/Planning recommends the Planning Commission:

a. Receive staff report and public testimony.

b. Adopt Planning Commission Resolution No. 20-01 (Attachment 1) recommending that the Board of Supervisors (1) make the appropriate findings under the California Environmental Quality Act (CEQA); (2) adopt amendments to the County of Orange Land Use, Transportation and Growth Management Elements to incorporate new metrics for California Environmental Quality Act transportation analysis to ensure compliance with recent state mandated changes; (3) delete the Transportation Implementation Manual from General Plan Transportation Element and adopt as a stand-alone document; (4) adopt the Guidelines for Evaluating Vehicle Miles Traveled Under CEQA (August 2020); and (5) adopt the 2020 Updated Transportation Implementation Manual.

BACKGROUND:

Senate Bill (SB) 743 was signed by the Governor in 2013 with the intent to more appropriately balance the needs of congestion management with statewide goals related to infill development, promotion of public health through active transportation, and reduction of greenhouse gas emissions. Implementation of SB 743 requires that analysis of transportation impacts for California Environmental Quality Act (CEQA) documents occur through an analysis of Vehicle Miles Travelled (VMT), not Level of Service (LOS), for Land Use Projects. For Transportation projects, lead agencies for roadway capacity projects have discretion, consistent with CEQA and planning requirements, to choose which metric to use to evaluate impacts.

In response to SB 743, the Governor's Office of Planning and Research (OPR) released a Technical Advisory on Evaluating Transportation Impacts in CEQA (December 2018) that contains recommendations regarding assessment of Vehicle Miles Traveled (VMT), thresholds of significance, and mitigation measures (Attachment 2). More specifically, for land use projects, OPR identified VMT per capita, VMT per employee, and net VMT, as new metrics for transportation analysis in CEQA.

PROPOSED PROJECT:

On May 27, 2020, Planning Commission authorized staff to initiate GPA 20-01 to ensure compliance with recent State mandated changes regarding new metrics for California Environmental Quality Act transportation analysis. On June 23, 2020, the County of Orange Board of Supervisors requested that the Governor extend the implementation date of SB 743 provisions until at least July 1, 2021, and that staff report back to the County within 120 days, and annually thereafter, as a result of the COVID-19 emergency. Since then, SB 743 provisions became effective statewide on July 1, 2020, as scheduled. Multiple jurisdictions throughout California have and continue to adopt transportation analysis guidelines addressing VMT.

OC Development Services and other internal County agencies with consultation from LSA Associates, Inc., the A-E firm that was selected to assist with the SB 743 implementation for the County of Orange, completed the following items: a) Guidelines for Evaluating Vehicle Miles Traveled Under CEQA; and b) VMT mapping tool to assess VMT impacts for land development projects, roadway improvement projects and other infrastructure projects.

In particular, the Guidelines for Evaluating Vehicle Miles Traveled Under CEQA (Attachment 3) will serve as a guide for application of VMT analysis to CEQA reviews and will provide substantial evidence for the County of Orange's project screenings significance thresholds and mitigation strategies. The County's Guidelines for Evaluating Vehicle Miles Traveled Under CEQA are modeled after OPR's Technical Advisory on Evaluating Transportation Impacts in CEQA for CEQA transportation studies. If the County is the Lead Agency, but the project is located in another jurisdiction, these guidelines would apply. However, if the County is not the Lead Agency, and the project is located in another jurisdiction, the Lead Agency would determine which VMT guidelines should be utilized for analysis. As in previous CEQA practice, the applicant/project proponent will still be required to provide applicable LOS traffic analysis that is specific to the proposed project to be reviewed and approved by the County. In addition, the applicant/project proponent will now be required to provide information on VMT, unless the project is exempt from VMT analysis.

Below is an outline of topics that are covered in the County's Guidelines for Evaluating Vehicle Miles Traveled Under CEQA:

a. **Orange County is defined as the region** for CEQA land development transportation analysis, since the majority of the unincorporated county trips are contained within the entirety of Orange County (approximately 88 percent) and many other large urbanized areas are defining their region as their counties.

b. **Project screening criteria** will screen out projects with certain criteria that, by their nature, or by virtue of other factors, would result in less than significant transportation impacts.

1. **Land development projects** that have one or more of the following attributes may be presumed to create a less than significant impact without undergoing additional detailed traffic analysis: (a) projects in high-quality transit areas; (b) neighborhood retail projects; (c) affordable housing projects; (d) low vehicle miles traveled (VMT) area projects; (e) small projects generating 500 or fewer average daily trips; and (f) public facilities.

2. **Transportation projects** presumed to create a less than significant impact without undergoing additional detailed traffic analysis include: (a) rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets; (b) roadside safety devices or hardware installation; and (c) roadway shoulder enhancements to provide "breakdown" space dedicated space for use only by transit vehicles. The OPR Technical Advisory on Evaluating Transportation Impacts in CEQA also lists a series of transportation projects that would not likely lead to a substantial or measurable increase in vehicle travel and that, therefore, would generally not require an induced travel analysis. These projects are adopted in the County's Guidelines for Evaluating Vehicle Miles Traveled Under CEQA. Additionally, transit and active transportation projects generally reduce VMT and are, therefore, presumed to cause a less than significant impact on transportation. This presumption may apply to all passenger rail projects, bus and bus rapid-transit projects, and bicycle and pedestrian infrastructure projects.

c. **Thresholds of significance for a transportation project** is an additional VMT generated by the project either due to increased roadway use or as a result of induced growth attributable to the project.

d. **Thresholds of significance for the following land uses are as follows:**

Residential	15 percent below existing regional average VMT per capita (current calculation for existing regional average is 17.9 (average VMT/capita X 0.85 = 15.2)
Office	15 percent below existing regional average VMT per employee (24.1 average VMT/employee X 0.85 = 20.5)
Retail	no net change in total VMT

Mixed Use	consider each component of the project separately based on the threshold for residential, office, retail, etc. and take credit for internal capture
Other Land Uses (not listed above)	no net change in VMT per employee if consistent with the General Plan or 15 percent below regional average if seeking a General Plan Amendment

e. **Mitigation strategies** are identified to reduce, avoid, or offset the impact the specific project-related impacts. Potential mitigation strategies may include onsite improvements (i.e. pedestrian improvements and increased density) and financial incentives (i.e. subsidized transit passes). Guidelines for Evaluating Vehicle Miles Traveled under CEQA also lists some ideas for potential mitigation strategies that may be applied to the project.

f. **VMT mapping tool** developed by LSA Associates, Inc. to assist with assessment of VMT impacts for land development projects, roadway improvement projects and other infrastructure projects within the unincorporated area so that prospective applicants can gauge the VMT levels of their proposed project and staff can validate data.

In addition to the creation of the County's Guidelines for Evaluating Vehicle Miles Traveled Under CEQA, staff is proposing edits to the Land Use, Growth Management and Transportation Elements, and the adoption of the 2020 Updated Transportation Implementation Manual to also incorporate VMT analysis (see Attachments 4-7).

Because the County's Guidelines for Evaluating Vehicle Miles Traveled Under CEQA document has not been adopted, in the interim, the County has been utilizing the VMT metrics outlined in the OPR Technical Advisory on Evaluating Transportation Impacts in CEQA to assist with the evaluation of discretionary projects under CEQA within unincorporated Orange County and in cases where the County serves as the Lead Agency for projects located in another jurisdiction. The County will also continue to apply the LOS analysis or other traditional metrics to determine traffic impacts for operational level assessment as appropriate under the Traffic Implementation Manual. At this time, staff is recommending adoption of VMT guidelines specific to the County of Orange so that potential and current applicants are aware of the new regulations and can address them accordingly.

In response to the County of Orange Board of Supervisors resolution (see Attachment 8), which references behavioral changes leading to fluctuations in transportation patterns as a result of the COVID-19 emergency, staff is recommending that the Transportation Implementation Manual be deleted as an Appendix of the General Plan and further updated by OC Public Works/Infrastructure as a stand-alone document in the near future. Additional changes from those now being proposed to address VMT

analysis will include updates to any outdated sections related to transportation metrics and reflect any new data on current conditions when it becomes available.

CEQA COMPLIANCE:

This action is not a project within the meaning of CEQA Guidelines Section 15378 and is therefore not subject to CEQA, since it does not have the potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment. The approval of this agenda item does not commit the County to a definite course of action in regard to a project since the action being authorized involves the recommendation of a General Plan Amendment to ensure compliance with recent State mandated changes regarding new metrics for CEQA transportation analysis, which is administrative. This proposed activity is therefore not subject to CEQA. Any future action connected to this approval that constitutes a project will be reviewed for compliance with CEQA.

Submitted by:

Joanna Chang

Joanna Chang, Land Use Manager
OC Development Services/Planning

Reviewed by,

Richard Vuong, Interim Deputy Director
OC Public Works/Development Services

Attachment 1 Draft Planning Commission Resolution

Attachment 2 Governor's Office of Planning and Research - Technical Advisory on Evaluating Transportation Impacts in CEQA (December 2018)

Attachment 3 Guidelines for Evaluating Vehicle Miles Traveled Under CEQA prepared by LSA Associates, Inc. (August 2020)

Attachment 4 Proposed Changes to Land Use Element

Attachment 5 Proposed Changes to Transportation Element

Attachment 6 Proposed Changes to Growth Management Element

Attachment 7 2020 Updated Transportation Implementation Manual

Attachment 8 Supplemental Agenda Item dated June 23, 2020

Attachment 1

RESOLUTION NO. 20-01
RESOLUTION OF THE PLANNING COMMISSION OF
ORANGE COUNTY, CALIFORNIA

August 26, 2020

On Motion of Commissioner _____, duly seconded and carried, the following Resolution was adopted:

WHEREAS, Senate Bill (SB) 743 was signed by the Governor on September 27, 2013 with the intent to more appropriately balance the needs of congestion management with statewide goals related to infill development, promotion of public health through active transportation, and reduction of greenhouse gas emissions through adoption of a new metric, Vehicle Miles Traveled (VMT) for California Environmental Quality Act (CEQA) environmental reviews; and

WHEREAS, following the passage of SB 743, the Governor's Office of Planning and Research (OPR) released a Technical Advisory on Evaluating Transportation Impacts in CEQA (December 2018) that contains recommendations regarding assessment of Vehicle Miles Traveled (VMT), thresholds of significance, and mitigation measures; and

WHEREAS, SB 743 provisions became effective statewide on July 1, 2020, as scheduled, and multiple jurisdictions throughout California have and continue to adopt VMT as the metric for CEQA analysis; and

WHEREAS, the County of Orange has been utilizing the VMT metrics outlined in the OPR Technical Advisory on Evaluating Transportation Impacts in CEQA (December 2018) to assist with the evaluation of discretionary projects under CEQA within unincorporated Orange County and in cases where the County serves as the Lead Agency for projects located in another jurisdiction, and will continue to apply the LOS analysis or other traditional metrics to determine traffic impacts for operational level assessment as appropriate in the interim; and

WHEREAS, staff is recommending adoption of County Guidelines for Evaluating Vehicle Miles Traveled under CEQA (August 2020) so that potential and current applicants are aware of the new metrics and evaluation parameters for CEQA, and can address those accordingly; and

WHEREAS, in compliance with the California Environmental Quality Act (California Public Resources Code, Section 21000 *et* seq.) (CEQA) and the CEQA Guidelines (title 14, California Code of Regulations, Section 15000 *et* seq.), the County, as Lead Agency, has determined that the proposed General Plan Amendment GPA 20-01 – Land Use, Transportation and Growth Management Elements, is not a project within the meaning of CEQA Guidelines Section 15378 and is therefore not subject to CEQA; and

WHEREAS, on May 27, 2020 this Planning Commission approved authorization to initiate proposed General Plan Amendment GPA 20-01 – Land Use, Transportation and Growth Management Elements; and

WHEREAS, on August 26, 2020 this Planning Commission conducted a public hearing regarding proposed General Plan Amendment GPA 20-01 – Land Use, Transportation and Growth Management Elements; and

WHEREAS, the Planning Commission has reviewed and fully considered the proposed General Plan Amendment GPA 20-01 - Land Use, Transportation and Growth Management Elements, has heard and considered the public comments that were presented to it at the public hearing held on this project, and has determined after review and consideration to recommend adoption by the Board of Supervisors of proposed General Plan Amendment GPA 20-01 - Land Use, Transportation and Growth Management Elements.

NOW, THEREFORE, BE IT RESOLVED THAT:

1. The Planning Commission finds that the proposed project is not a project within the meaning of CEQA Guidelines Section 15378 and is therefore not subject to CEQA.

2. The Planning Commission recommends the Board of Supervisors adopt the proposed General Plan Amendment GPA 20-01 – Land Use, Transportation and Growth Management Elements with the attached revisions to the County of Orange Land Use, Transportation and Growth Management elements and delete the Transportation Implementation Manual as Appendix IV-1, to the General Plan. (Attachments A-C.)

3. The Planning Commission recommends the Board of Supervisors adopt the Guidelines for Evaluating Vehicle Miles Traveled Under CEQA prepared by LSA Associates, Inc. (August 2020) and the 2020 Updated Transportation Implementation Manual (Attachments D and E.)

The foregoing resolution was passed and adopted by the following vote of the Orange County Planning Commission, on August 26, 2020 to wit:

Ayes:
Noes:
Excused:
Abstained:

I HEREBY CERTIFY that the foregoing Resolution No. 20-01 was adopted on August 26, 2020, by the Orange County Planning Commission.

_____

Richard Vuong
Interim Executive Officer, Orange County Planning Commission

Resolution No. 20-01
Attachments:
Attachment A: Proposed Changes to Land Use Element
Attachment B: Proposed Changes to Transportation Element
Attachment C: Proposed Changes to Growth Management Element
Attachment D: Guidelines for Evaluating Vehicle Miles Traveled Under CEQA prepared by LSA Associates, Inc. (August 2020)
Attachment E: 2020 Updated Transportation Implementation Manual

Date of Adoption: August 26, 2020

Attachment 2

TECHNICAL ADVISORY

ON EVALUATING TRANSPORTATION IMPACTS IN CEQA

December 2018

Contents

A. Introduction

This technical advisory is one in a series of advisories provided by the Governor's Office of Planning and Research (OPR) as a service to professional planners, land use officials, and CEQA practitioners. OPR issues technical assistance on issues that broadly affect the practice of land use planning and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). (Gov. Code, § 65040, subds. (g), (l), (m).) The purpose of this document is to provide advice and recommendations, which agencies and other entities may use at their discretion. This document does not alter lead agency discretion in preparing environmental documents subject to CEQA. This document should not be construed as legal advice.

Senate Bill 743 (Steinberg, 2013), which was codified in Public Resources Code section 21099, required changes to the guidelines implementing CEQA (CEQA Guidelines) (Cal. Code Regs., Title 14, Div. 6, Ch. 3, § 15000 et seq.) regarding the analysis of transportation impacts. As one appellate court recently explained: "During the last 10 years, the Legislature has charted a course of long-term sustainability based on denser infill development, reduced reliance on individual vehicles and improved mass transit, all with the goal of reducing greenhouse gas emissions. Section 21099 is part of that strategy . . . ." (*Covina Residents for Responsible Development v. City of Covina* (2018) 21 Cal.App.5th 712, 729.) Pursuant to Section 21099, the criteria for determining the significance of transportation impacts must "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." (*Id.*, subd. (b)(1); see generally, adopted CEQA Guidelines, § 15064.3, subd. (b) [Criteria for Analyzing Transportation Impacts].) To that end, in developing the criteria, OPR has proposed, and the California Natural Resources Agency (Agency) has certified and adopted, changes to the CEQA Guidelines that identify vehicle miles traveled (VMT) as the most appropriate metric to evaluate a project's transportation impacts. With the California Natural Resources Agency's certification and adoption of the changes to the CEQA Guidelines, automobile delay, as measured by "level of service" and other similar metrics, generally no longer constitutes a significant environmental effect under CEQA. (Pub. Resources Code, § 21099, subd. (b)(3).)

This advisory contains technical recommendations regarding assessment of VMT, thresholds of significance, and mitigation measures. Again, OPR provides this Technical Advisory as a resource for the public to use at their discretion. OPR is not enforcing or attempting to enforce any part of the recommendations contained herein. (Gov. Code, § 65035 ["It is not the intent of the Legislature to vest in the Office of Planning and Research any direct operating or regulatory powers over land use, public works, or other state, regional, or local projects or programs."].)

This December 2018 technical advisory is an update to the advisory it published in April 2018. OPR will continue to monitor implementation of these new provisions and may update or supplement this advisory in response to new information and advancements in modeling and methods.

B. Background

VMT and Greenhouse Gas Emissions Reduction. Senate Bill 32 (Pavley, 2016) requires California to reduce greenhouse gas (GHG) emissions 40 percent below 1990 levels by 2030, and Executive Order B-16-12 provides a target of 80 percent below 1990 emissions levels for the transportation sector by 2050. The transportation sector has three major means of reducing GHG emissions: increasing vehicle efficiency, reducing fuel carbon content, and reducing the amount of vehicle travel. The California Air Resources Board (CARB) has provided a path forward for achieving these emissions reductions from the transportation sector in its 2016 Mobile Source Strategy. CARB determined that it will not be possible to achieve the State's 2030 and post-2030 emissions goals without reducing VMT growth. Further, in its 2018 Progress Report on California's Sustainable Communities and Climate Protection Act, CARB found that despite the State meeting its 2020 climate goals, "emissions from statewide passenger vehicle travel per capita [have been] increasing and going in the wrong direction," and "California cannot meet its [long-term] climate goals without curbing growth in single-occupancy vehicle activity."[1] CARB also found that "[w]ith emissions from the transportation sector continuing to rise despite increases in fuel efficiency and decreases in the carbon content of fuel, California will not achieve the necessary greenhouse gas emissions reductions to meet mandates for 2030 and beyond without significant changes to how communities and transportation systems are planned, funded, and built."[2]

Thus, to achieve the State's long-term climate goals, California needs to reduce per capita VMT. This can occur under CEQA through VMT mitigation. Half of California's GHG emissions come from the transportation sector[3], therefore, reducing VMT is an effective climate strategy, which can also result in co-benefits.[4] Furthermore, without early VMT mitigation, the state may follow a path that meets GHG targets in the early years, but finds itself poorly positioned to meet more stringent targets later. For example, in absence of VMT analysis and mitigation in CEQA, lead agencies might rely upon verifiable offsets for GHG mitigation, ignoring the longer-term climate change impacts resulting from land use development and infrastructure investment decisions. As stated in CARB's 2017 Scoping Plan:

> "California's future climate strategy will require increased focus on integrated land use planning to support livable, transit-connected communities, and conservation of agricultural and other lands. Accommodating population and economic growth through travel- and energy-efficient land use provides GHG-efficient growth, reducing GHGs from both transportation and building energy use. GHGs can be further reduced at the project level through implementing energy-efficient construction and travel demand management approaches."[5] (*Id.* at p. 102.)

[1] California Air Resources Board (Nov. 2018) *2018 Progress Report on California's Sustainable Communities and Climate Protection Act*, pp. 4, 5, available at https://ww2.arb.ca.gov/sites/default/files/2018-11/Final2018Report_SB150_112618_02_Report.pdf.
[2] *Id.*, p. 28.
[3] See https://ca50million.ca.gov/transportation/
[4] Fang et al. (2017) *Cutting Greenhouse Gas Emissions Is Only the Beginning: A Literature Review of the Co-Benefits of Reducing Vehicle Miles Traveled*.
[5] California Air Resources Board (Nov. 2017) *California's 2017 Climate Change Scoping Plan*, p. 102, available at https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf.

In light of this, the 2017 Scoping Plan describes and quantifies VMT reductions needed to achieve our long-term GHG emissions reduction goals, and specifically points to the need for statewide deployment of the VMT metric in CEQA:

> "Employing VMT as the metric of transportation impact statewide will help to ensure GHG reductions planned under SB 375 will be achieved through on-the-ground development, and will also play an important role in creating the additional GHG reductions needed beyond SB 375 across the State. Implementation of this change will rely, in part, on local land use decisions to reduce GHG emissions associated with the transportation sector, both at the project level, and in long-term plans (including general plans, climate action plans, specific plans, and transportation plans) and supporting sustainable community strategies developed under SB 375."[6]

VMT and Other Impacts to Health and Environment. VMT mitigation also creates substantial benefits (sometimes characterized as "co-benefits" to GHG reduction) in both in the near-term and the long-term. Beyond GHG emissions, increases in VMT also impact human health and the natural environment. Human health is impacted as increases in vehicle travel lead to more vehicle crashes, poorer air quality, increases in chronic diseases associated with reduced physical activity, and worse mental health. Increases in vehicle travel also negatively affect other road users, including pedestrians, cyclists, other motorists, and many transit users. The natural environment is impacted as higher VMT leads to more collisions with wildlife and fragments habitat. Additionally, development that leads to more vehicle travel also tends to consume more energy, water, and open space (including farmland and sensitive habitat). This increase in impermeable surfaces raises the flood risk and pollutant transport into waterways.[7]

VMT and Economic Growth. While it was previously believed that VMT growth was a necessary component of economic growth, data from the past two decades shows that economic growth is possible without a concomitant increase in VMT. (Figure 1.) Recent research shows that requiring development projects to mitigate LOS may actually reduce accessibility to destinations and impede economic growth.[8,9]

[6] *Id.* at p. 76.
[7] Fang et al. (2017) *Cutting Greenhouse Gas Emissions Is Only the Beginning: A Literature Review of the Co-Benefits of Reducing Vehicle Miles Traveled*, available at https://ncst.ucdavis.edu/wp-content/uploads/2017/03/NCST-VMT-Co-Benefits-White-Paper_Fang_March-2017.pdf.
[8] Haynes et al. (Sept. 2015) *Congested Development: A Study of Traffic Delays, Access, and Economic Activity in Metropolitan Los Angeles*, available at http://www.its.ucla.edu/wp-content/uploads/sites/6/2015/11/Haynes_Congested-Development_1-Oct-2015_final.pdf.
[9] Osman et al. (Mar. 2016) *Not So Fast: A Study of Traffic Delays, Access, and Economic Activity in the San Francisco Bay Area*, available at http://www.its.ucla.edu/wp-content/uploads/sites/6/2016/08/Taylor-Not-so-Fast-04-01-2016_final.pdf.

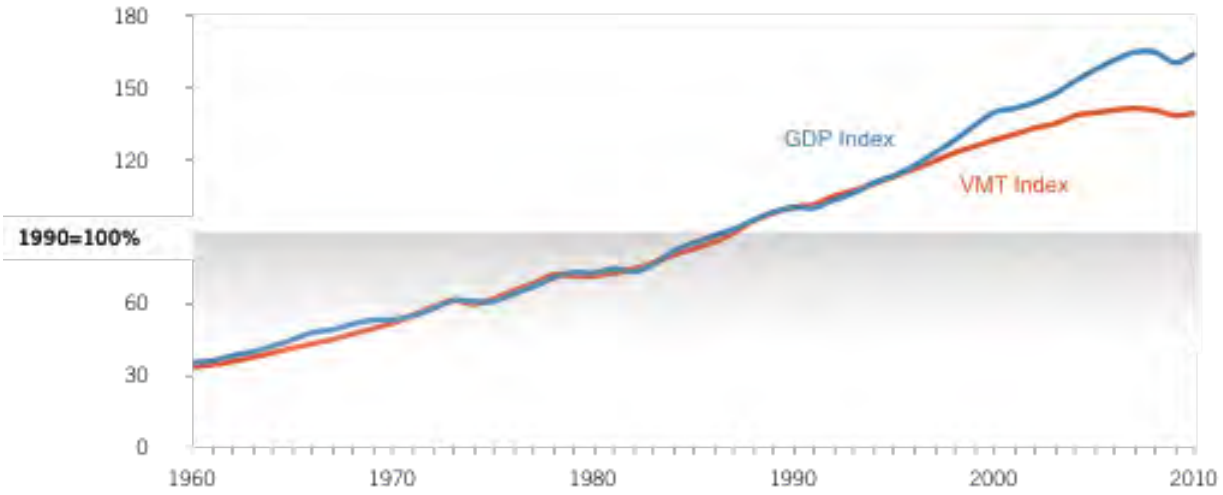

Figure 1. Kooshian and Winkelman (2011) *VMT and Gross Domestic Product (GDP), 1960-2010*.

C. Technical Considerations in Assessing Vehicle Miles Traveled

Many practitioners are familiar with accounting for VMT in connection with long-range planning, or as part of the CEQA analysis of a project's greenhouse gas emissions or energy impacts. This document provides technical information on how to assess VMT as part of a transportation impacts analysis under CEQA. Appendix 1 provides a description of which VMT to count and options on how to count it. Appendix 2 provides information on induced travel resulting from roadway capacity projects, including the mechanisms giving rise to induced travel, the research quantifying it, and information on additional approaches for assessing it.

1. Recommendations Regarding Methodology

Proposed Section 15064.3 explains that a "lead agency may use models to estimate a project's vehicle miles traveled . . . ." CEQA generally defers to lead agencies on the choice of methodology to analyze impacts. (*Santa Monica Baykeeper v. City of Malibu* (2011) 193 Cal.App.4th 1538, 1546; see *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 409 ["the issue is not whether the studies are irrefutable or whether they could have been better" … rather, the "relevant issue is only whether the studies are sufficiently credible to be considered" as part of the lead agency's overall evaluation].) This section provides suggestions to lead agencies regarding methodologies to analyze VMT associated with a project.

Vehicle Types. Proposed Section 15064.3, subdivision (a), states, "For the purposes of this section, 'vehicle miles traveled' refers to the amount and distance of automobile travel attributable to a project." Here, the term "automobile" refers to on-road passenger vehicles, specifically cars and light trucks. Heavy-duty truck VMT could be included for modeling convenience and ease of calculation (for example, where models or data provide combined auto and heavy truck VMT). For an apples-to-apples

comparison, vehicle types considered should be consistent across project assessment, significance thresholds, and mitigation.

Residential and Office Projects. Tour- and trip-based approaches[10] offer the best methods for assessing VMT from residential/office projects and for comparing those assessments to VMT thresholds. These approaches also offer the most straightforward methods for assessing VMT reductions from mitigation measures for residential/office projects. When available, tour-based assessment is ideal because it captures travel behavior more comprehensively. But where tour-based tools or data are not available for all components of an analysis, a trip-based assessment of VMT serves as a reasonable proxy.

Models and methodologies used to calculate thresholds, estimate project VMT, and estimate VMT reduction due to mitigation should be comparable. For example:

- A tour-based assessment of project VMT should be compared to a tour-based threshold, or a trip-based assessment to a trip-based VMT threshold.
- Where a travel demand model is used to determine thresholds, the same model should also be used to provide trip lengths as part of assessing project VMT.
- Where only trip-based estimates of VMT reduction from mitigation are available, a trip-based threshold should be used, and project VMT should be assessed in a trip-based manner.

When a trip-based method is used to analyze a residential project, the focus can be on home-based trips. Similarly, when a trip-based method is used to analyze an office project, the focus can be on home-based work trips.

When tour-based models are used to analyze an office project, either employee work tour VMT or VMT from all employee tours may be attributed to the project. This is because workplace location influences overall travel. For consistency, the significance threshold should be based on the same metric: either employee work tour VMT or VMT from all employee tours.

For office projects that feature a customer component, such as a government office that serves the public, a lead agency can analyze the customer VMT component of the project using the methodology for retail development (see below).

Retail Projects. Generally, lead agencies should analyze the effects of a retail project by assessing the change in total VMT[11] because retail projects typically re-route travel from other retail destinations. A retail project might lead to increases or decreases in VMT, depending on previously existing retail travel patterns.

[10] See Appendix 1, *Considerations About Which VMT to Count,* for a description of these approaches.
[11] See Appendix 1, *Considerations About Which VMT to Count, "*Assessing Change in Total VMT" section, for a description of this approach.

Considerations for All Projects. Lead agencies should not truncate any VMT analysis because of jurisdictional or other boundaries, for example, by failing to count the portion of a trip that falls outside the jurisdiction or by discounting the VMT from a trip that crosses a jurisdictional boundary. CEQA requires environmental analyses to reflect a "good faith effort at full disclosure." (CEQA Guidelines, § 15151.) Thus, where methodologies exist that can estimate the full extent of vehicle travel from a project, the lead agency should apply them to do so. Where those VMT effects will grow over time, analyses should consider both a project's short-term and long-term effects on VMT.

Combining land uses for VMT analysis is not recommended. Different land uses generate different amounts of VMT, so the outcome of such an analysis could depend more on the mix of uses than on their travel efficiency. As a result, it could be difficult or impossible for a lead agency to connect a significance threshold with an environmental policy objective (such as a target set by law), inhibiting the CEQA imperative of identifying a project's significant impacts and providing mitigation where feasible. Combining land uses for a VMT analysis could streamline certain mixes of uses in a manner disconnected from policy objectives or environmental outcomes. Instead, OPR recommends analyzing each use separately, or simply focusing analysis on the dominant use, and comparing each result to the appropriate threshold. Recommendations for methods of analysis and thresholds are provided below. In the analysis of each use, a mixed-use project should take credit for internal capture.

Any project that includes in its geographic bounds a portion of an existing or planned Transit Priority Area (i.e., the project is within a ½ mile of an existing or planned major transit stop or an existing stop along a high quality transit corridor) may employ VMT as its primary metric of transportation impact for the entire project. (See Pub. Resources Code, § 21099, subds. (a)(7), (b)(1).)

Cumulative Impacts. A project's cumulative impacts are based on an assessment of whether the "incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." (Pub. Resources Code, § 21083, subd. (b)(2); see CEQA Guidelines, § 15064, subd. (h)(1).) When using an absolute VMT metric, i.e., total VMT (as recommended below for retail and transportation projects), analyzing the combined impacts for a cumulative impacts analysis may be appropriate. However, metrics such as VMT per capita or VMT per employee, i.e., metrics framed in terms of efficiency (as recommended below for use on residential and office projects), cannot be summed because they employ a denominator. A project that falls below an efficiency-based threshold that is aligned with long-term environmental goals and relevant plans would have no cumulative impact distinct from the project impact. Accordingly, a finding of a less-than-significant project impact would imply a less than significant cumulative impact, and vice versa. This is similar to the analysis typically conducted for greenhouse gas emissions, air quality impacts, and impacts that utilize plan compliance as a threshold of significance. (See *Center for Biological Diversity v. Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 219, 223; CEQA Guidelines, § 15064, subd. (h)(3).)

D. General Principles to Guide Consideration of VMT

SB 743 directs OPR to establish specific "criteria for determining the significance of transportation impacts of projects[.]" (Pub. Resources Code, § 21099, subd. (b)(1).) In establishing this criterion, OPR was guided by the general principles contained within CEQA, the CEQA Guidelines, and applicable case law.

To assist in the determination of significance, many lead agencies rely on "thresholds of significance." The CEQA Guidelines define a "threshold of significance" to mean "an identifiable **quantitative, qualitative[12] or performance level** of a particular environmental effect, non-compliance with which means the effect will ***normally*** be determined to be significant by the agency and compliance with which means the effect ***normally*** will be determined to be less than significant." (CEQA Guidelines, § 15064.7, subd. (a) (emphasis added).) Lead agencies have discretion to develop and adopt their own, or rely on thresholds recommended by other agencies, "provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence." (*Id*. at subd. (c); *Save Cuyama Valley v. County of Santa Barbara* (2013) 213 Cal.App.4th 1059, 1068.) Substantial evidence means "enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached." (*Id*. at § 15384 (emphasis added); *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1108-1109.)

Additionally, the analysis leading to the determination of significance need not be perfect. The CEQA Guidelines describe the standard for adequacy of environmental analyses:

> An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to **make a decision which intelligently takes account of environmental consequences**. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is **reasonably feasible**. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The **courts have looked not for perfection** but for **adequacy**, **completeness**, and a **good faith effort** at full disclosure.

(CEQA Guidelines, § 15151 (emphasis added).)

These general principles guide OPR's recommendations regarding thresholds of significance for VMT set forth below.

[12] Generally, qualitative analyses should only be conducted when methods do not exist for undertaking a quantitative analysis.

E. Recommendations Regarding Significance Thresholds

As noted above, lead agencies have the discretion to set or apply their own thresholds of significance. (*Center for Biological Diversity v. California Dept. of Fish & Wildlife* (2015) 62 Cal.4th 204, 218-223 [lead agency had discretion to use compliance with AB 32's emissions goals as a significance threshold]; *Save Cuyama Valley v. County of Santa Barbara* (2013) 213 Cal.App.4th at p. 1068.) However, Section 21099 of the Public Resources Code states that the criteria for determining the significance of transportation impacts must promote: (1) reduction of greenhouse gas emissions; (2) development of multimodal transportation networks; and (3) a diversity of land uses. It further directed OPR to prepare and develop criteria for determining significance. (Pub. Resources Code, § 21099, subd. (b)(1).) This section provides OPR's suggested thresholds, as well as considerations for lead agencies that choose to adopt their own

The VMT metric can support the three statutory goals: "the reduction of greenhouse gas emissions, the development of multimodal transportation networks, ***and*** a diversity of land uses." (Pub. Resources Code, § 21099, subd. (b)(1), emphasis added.) However, in order for it to promote and support all three, lead agencies should select a significance threshold that aligns with state law on all three. State law concerning the development of multimodal transportation networks and diversity of land uses requires planning for and prioritizing increases in complete streets and infill development, but does not mandate a particular depth of implementation that could translate into a particular threshold of significance. Meanwhile, the State has clear quantitative targets for GHG emissions reduction set forth in law and based on scientific consensus, and the depth of VMT reduction needed to achieve those targets has been quantified. Tying VMT thresholds to GHG reduction also supports the two other statutory goals. Therefore, to ensure adequate analysis of transportation impacts, OPR recommends using quantitative VMT thresholds linked to GHG reduction targets when methods exist to do so.

Various legislative mandates and state policies establish quantitative greenhouse gas emissions reduction targets. For example:

- Assembly Bill 32 (2006) requires statewide GHG emissions reductions to 1990 levels by 2020 and continued reductions beyond 2020.

- Senate Bill 32 (2016) requires at least a 40 percent reduction in GHG emissions from 1990 levels by 2030.

- Pursuant to Senate Bill 375 (2008), the California Air Resources Board GHG emissions reduction targets for metropolitan planning organizations (MPOs) to achieve based on land use patterns and transportation systems specified in Regional Transportation Plans and Sustainable Community Strategies (RTP/SCS). Current targets for the State's largest MPOs call for a 19 percent reduction in GHG emissions from cars and light trucks from 2005 emissions levels by 2035.

- Executive Order B-30-15 (2015) sets a GHG emissions reduction target of 40 percent below 1990 levels by 2030.

- Executive Order S-3-05 (2005) sets a GHG emissions reduction target of 80 percent below 1990 levels by 2050.

- Executive Order B-16-12 (2012) specifies a GHG emissions reduction target of 80 percent below 1990 levels by 2050 specifically for transportation.

- Executive Order B-55-18 (2018) established an additional statewide goal of achieving carbon neutrality as soon as possible, but no later than 2045, and maintaining net negative emissions thereafter. It states, "The California Air Resources Board shall work with relevant state agencies to develop a framework for implementation and accounting that tracks progress toward this goal."

- Senate Bill 391 requires the California Transportation Plan to support 80 percent reduction in GHGs below 1990 levels by 2050.

- The *California Air Resources Board Mobile Source Strategy* (2016) describes California's strategy for containing air pollutant emissions from vehicles, and quantifies VMT growth compatible with achieving state targets.

- The California Air Resources Board's *2017 Climate Change Scoping Plan Update: The Strategy for Achieving California's 2030 Greenhouse Gas Target* describes California's strategy for containing GHG emissions from vehicles, and quantifies VMT growth compatible with achieving state targets.

Considering these various targets, the California Supreme Court observed:

> Meeting our statewide reduction goals does not preclude all new development. Rather, the Scoping Plan … assumes continued growth and depends on increased efficiency and conservation in land use and transportation from all Californians.

(*Center for Biological Diversity v. California Dept. of Fish & Wildlife*, *supra*, 62 Cal.4th at p. 220.) Indeed, the Court noted that when a lead agency uses consistency with climate goals as a way to determine significance, particularly for long-term projects, the lead agency must consider the project's effect on meeting long-term reduction goals. (*Ibid*.) And more recently, the Supreme Court stated that "CEQA requires public agencies . . . to ensure that such analysis stay in step with evolving scientific knowledge and state regulatory schemes." (*Cleveland National Forest Foundation v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497, 504.)

Meeting the targets described above will require substantial reductions in existing VMT per capita to curb GHG emissions and other pollutants. But targets for overall GHG emissions reduction do not translate directly into VMT thresholds for individual projects for many reasons, including:

- Some, but not all, of the emissions reductions needed to achieve those targets could be accomplished by other measures, including increased vehicle efficiency and decreased fuel carbon content. The CARB's *First Update to the Climate Change Scoping Plan* explains:

"Achieving California's long-term criteria pollutant and GHG emissions goals will require four strategies to be employed: (1) improve vehicle efficiency and develop zero emission technologies, (2) reduce the carbon content of fuels and provide market support to get these lower-carbon fuels into the marketplace, (3) **plan and build communities to reduce vehicular GHG emissions and provide more transportation options, and (4) improve the efficiency and throughput of existing transportation systems.**"[13] CARB's *2018 Progress Report on California's Sustainable Communities and Climate Protection Act* states on page 28 that "California cannot meet its climate goals without curbing growth in single-occupancy vehicle activity." In other words, vehicle efficiency and better fuels are necessary, but insufficient, to address the GHG emissions from the transportation system. Land use patterns and transportation options also will need to change to support reductions in vehicle travel/VMT.

- New land use projects alone will not sufficiently reduce per-capita VMT to achieve those targets, nor are they expected to be the sole source of VMT reduction.

- Interactions between land use projects, and also between land use and transportation projects, existing and future, together affect VMT.

- Because location within the region is the most important determinant of VMT, in some cases, streamlining CEQA review of projects in travel efficient locations may be the most effective means of reducing VMT.

- When assessing climate impacts of some types of land use projects, use of an efficiency metric (e.g., per capita, per employee) may provide a better measure of impact than an absolute numeric threshold. (*Center for Biological Diversity*, *supra*.)

Public Resources Code section 21099 directs OPR to propose criteria for determining the significance of transportation impacts. In this Technical Advisory, OPR provides its recommendations to assist lead agencies in selecting a significance threshold that may be appropriate for their particular projects. While OPR's Technical Advisory is not binding on public agencies, CEQA allows lead agencies to "consider thresholds of significance . . . recommended by other public agencies, provided the decision to adopt those thresholds is supported by substantial evidence." (CEQA Guidelines, § 15064.7, subd. (c).) Based on OPR's extensive review of the applicable research, and in light of an assessment by the California Air Resources Board quantifying the need for VMT reduction in order to meet the State's long-term climate goals, **OPR recommends that a per capita or per employee VMT that is fifteen percent below that of existing development may be a reasonable threshold**.

Fifteen percent reductions in VMT are achievable at the project level in a variety of place types.[14]

Moreover, a fifteen percent reduction is consistent with SB 743's direction to OPR to select a threshold that will help the State achieve its climate goals. As described above, section 21099 states that the

[13] California Air Resources Board (May 2014) *First Update to the Climate Change Scoping Plan*, p. 46 (emphasis added).
[14] CAPCOA (2010) *Quantifying Greenhouse Gas Mitigation Measures*, p. 55, available at http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

criteria for determining significance must "promote the reduction in greenhouse gas emissions." In its document *California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*[15], CARB assesses VMT reduction per capita consistent with its evidence-based modeling scenario that would achieve State climate goals of 40 percent GHG emissions reduction from 1990 levels by 2030 and 80 percent GHG emissions reduction levels from 1990 by 2050. Applying California Department of Finance population forecasts, CARB finds per-capita light-duty vehicle travel would need to be approximately 16.8 percent lower than existing, and overall per-capita vehicle travel would need to be approximately 14.3 percent lower than existing levels under that scenario. Below these levels, a project could be considered low VMT and would, on that metric, be consistent with 2017 Scoping Plan Update assumptions that achieve climate state climate goals.

CARB finds per capita vehicle travel would need to be kept below what today's policies and plans would achieve.

CARB's assessment is based on data in the 2017 Scoping Plan Update and 2016 Mobile Source Strategy. In those documents, CARB previously examined the relationship between VMT and the state's GHG emissions reduction targets. The Scoping Plan finds:

> "While the State can do more to accelerate and incentivize these local decisions, local actions that reduce VMT are also necessary to meet transportation sector-specific goals and achieve the 2030 target under SB 32. Through developing the Scoping Plan, CARB staff is more convinced than ever that, in addition to achieving GHG reductions from cleaner fuels and vehicles, California must also reduce VMT. Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward needed reductions, but alone will not provide the VMT growth reductions needed; there is a gap between what SB 375 can provide and what is needed to meet the State's 2030 and 2050 goals."[16]

Note that, at present, consistency with RTP/SCSs does not necessarily lead to a less-than-significant VMT impact.[17] As the Final 2017 Scoping Plan Update states,

> VMT reductions are necessary to achieve the 2030 target and must be part of any strategy evaluated in this Plan. Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward this goal, but alone will not provide all of the VMT growth reductions that will be needed. There is a gap between what SB 375 can provide and what is needed to meet the State's 2030 and 2050 goals."[18]

[15] California Air Resources Board (Jan. 2019) *California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*, available at https://ww2.arb.ca.gov/resources/documents/carb-2017-scoping-plan-identified-vmt-reductions-and-relationship-state-climate.
[16] California Air Resources Board (Nov. 2017) *California's 2017 Climate Change Scoping Plan*, p. 101.
[17] California Air Resources Board (Feb. 2018) *Updated Final Staff Report: Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets*, Figure 3, p. 35, available at https://www.arb.ca.gov/cc/sb375/sb375_target_update_final_staff_report_feb2018.pdf.
[18] California Air Resources Board (Nov. 2017) *California's 2017 Climate Change Scoping Plan*, p. 75.

Also, in order to capture the full effects of induced travel resulting from roadway capacity projects, an RTP/SCS would need to include an assessment of land use effects of those projects, and the effects of those land uses on VMT. (See section titled "*Estimating VMT Impacts from Transportation Projects"* below.) RTP/SCSs typically model VMT using a collaboratively-developed land use "vision" for the region's land use, rather than studying the effects on land use of the proposed transportation investments.

In summary, achieving 15 percent lower per capita (residential) or per employee (office) VMT than existing development is both generally achievable and is supported by evidence that connects this level of reduction to the State's emissions goals.

1. Screening Thresholds for Land Use Projects

Many agencies use "screening thresholds" to quickly identify when a project should be expected to cause a less-than-significant impact without conducting a detailed study. (See e.g., CEQA Guidelines, §§ 15063(c)(3)(C), 15128, and Appendix G.) As explained below, this technical advisory suggests that lead agencies may screen out VMT impacts using project size, maps, transit availability, and provision of affordable housing.

Screening Threshold for Small Projects

Many local agencies have developed screening thresholds to indicate when detailed analysis is needed. Absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with a Sustainable Communities Strategy (SCS) or general plan, projects that generate or attract fewer than 110 trips per day[19] generally may be assumed to cause a less-than-significant transportation impact.

Map-Based Screening for Residential and Office Projects

Residential and office projects that locate in areas with low VMT, and that incorporate similar features (i.e., density, mix of uses, transit accessibility), will tend to exhibit similarly low VMT. Maps created with VMT data, for example from a travel survey or a travel demand model, can illustrate areas that are

[19] CEQA provides a categorical exemption for existing facilities, including additions to existing structures of up to 10,000 square feet, so long as the project is in an area where public infrastructure is available to allow for maximum planned development and the project is not in an environmentally sensitive area. (CEQA Guidelines, § 15301, subd. (e)(2).) Typical project types for which trip generation increases relatively linearly with building footprint (i.e., general office building, single tenant office building, office park, and business park) generate or attract an additional 110-124 trips per 10,000 square feet. Therefore, absent substantial evidence otherwise, it is reasonable to conclude that the addition of 110 or fewer trips could be considered not to lead to a significant impact.

currently below threshold VMT (see recommendations below). Because new development in such locations would likely result in a similar level of VMT, such maps can be used to screen out residential and office projects from needing to prepare a detailed VMT analysis.

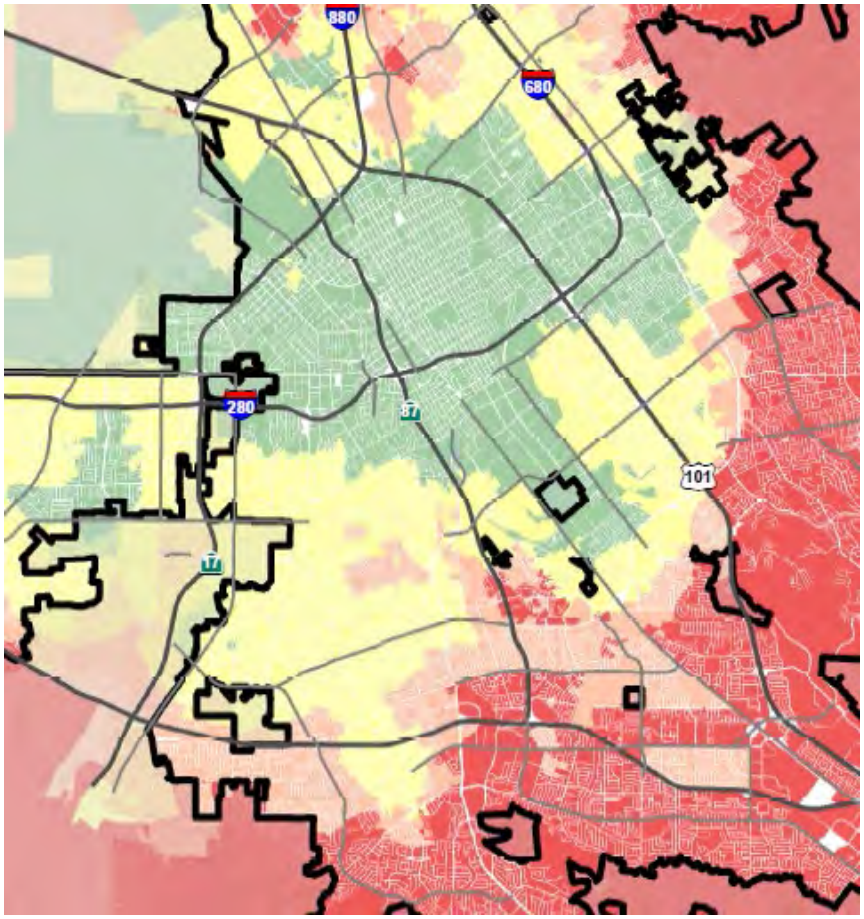

Figure 2. Example map of household VMT that could be used to delineate areas eligible to receive streamlining for VMT analysis. (Source: City of San José, Department of Transportation, draft output of City Transportation Model.)

Presumption of Less Than Significant Impact Near Transit Stations

Proposed CEQA Guideline Section 15064.3, subdivision (b)(1), states that lead agencies generally should presume that certain projects (including residential, retail, and office projects, as well as projects that are a mix of these uses) proposed within ½ mile of an existing major transit stop[20] or an existing stop

[20] Pub. Resources Code, § 21064.3 ("'Major transit stop' means a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods.").

along a high quality transit corridor[21] will have a less-than-significant impact on VMT. This presumption would not apply, however, if project-specific or location-specific information indicates that the project will still generate significant levels of VMT. For example, the presumption might not be appropriate if the project:

- Has a Floor Area Ratio (FAR) of less than 0.75
- Includes more parking for use by residents, customers, or employees of the project than required by the jurisdiction (if the jurisdiction requires the project to supply parking)
- Is inconsistent with the applicable Sustainable Communities Strategy (as determined by the lead agency, with input from the Metropolitan Planning Organization)
- Replaces affordable residential units with a smaller number of moderate- or high-income residential units

A project or plan near transit which replaces affordable residential units[22] with a smaller number of moderate- or high-income residential units may increase overall VMT because the increase in VMT of displaced residents could overwhelm the improvements in travel efficiency enjoyed by new residents.[23]

If any of these exceptions to the presumption might apply, the lead agency should conduct a detailed VMT analysis to determine whether the project would exceed VMT thresholds (see below).

Presumption of Less Than Significant Impact for Affordable Residential Development

Adding affordable housing to infill locations generally improves jobs-housing match, in turn shortening commutes and reducing VMT.[24,25] Further, "… low-wage workers in particular would be more likely to choose a residential location close to their workplace, if one is available."[26] In areas where existing jobs-housing match is closer to optimal, low income housing nevertheless generates less VMT than market-

[21] Pub. Resources Code, § 21155 ("For purposes of this section, a high-quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.").
[22] Including naturally-occurring affordable residential units.
[23] Chapple et al. (2017) *Developing a New Methodology for Analyzing Potential Displacement,* Chapter 4, pp. 159-160, available at https://www.arb.ca.gov/research/apr/past/13-310.pdf.
[24] Karner and Benner (2016) *The convergence of social equity and environmental sustainability: Jobs-housing fit and commute distance* ("[P]olicies that advance a more equitable distribution of jobs and housing by linking the affordability of locally available housing with local wage levels are likely to be associated with reduced commuting distances").
[25] Karner and Benner (2015) *Low-wage jobs-housing fit: identifying locations of affordable housing shortages.*
[26] Karner and Benner (2015) *Low-wage jobs-housing fit: identifying locations of affordable housing shortages.*

rate housing.[27,28] Therefore, a project consisting of a high percentage of affordable housing may be a basis for the lead agency to find a less-than-significant impact on VMT. Evidence supports a presumption of less than significant impact for a 100 percent affordable residential development (or the residential component of a mixed-use development) in infill locations. Lead agencies may develop their own presumption of less than significant impact for residential projects (or residential portions of mixed use projects) containing a particular amount of affordable housing, based on local circumstances and evidence. Furthermore, a project which includes any affordable residential units may factor the effect of the affordability on VMT into the assessment of VMT generated by those units.

2. Recommended Numeric Thresholds for Residential, Office, and Retail Projects

Recommended threshold for residential projects: A proposed project exceeding a level of 15 percent below existing VMT per capita may indicate a significant transportation impact. Existing VMT per capita may be measured as regional VMT per capita or as city VMT per capita. Proposed development referencing a threshold based on city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the number of units specified in the SCS for that city, and should be consistent with the SCS.

Residential development that would generate vehicle travel that is 15 or more percent below the existing residential VMT per capita, measured against the region or city, may indicate a less-than-significant transportation impact. In MPO areas, development measured against city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the population or number of units specified in the SCS for that city because greater-than-planned amounts of development in areas above the region-based threshold would undermine the VMT containment needed to achieve regional targets under SB 375.

For residential projects in unincorporated county areas, the local agency can compare a residential project's VMT to (1) the region's VMT per capita, or (2) the aggregate population-weighted VMT per capita of all cities in the region. In MPO areas, development in unincorporated areas measured against aggregate city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the population or number of units specified in the SCS for that city because greater-than-planned amounts of development in areas above the regional threshold would undermine achievement of regional targets under SB 375.

[27] Chapple et al. (2017) *Developing a New Methodology for Analyzing Potential Displacement*, available at https://www.arb.ca.gov/research/apr/past/13-310.pdf.
[28] CAPCOA (2010) *Quantifying Greenhouse Gas Mitigation Measures*, pp. 176-178, available at http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

These thresholds can be applied to either household (i.e., tour-based) VMT or home-based (i.e., trip-based) VMT assessments.[29] It is critical, however, that the agency be consistent in its VMT measurement approach throughout the analysis to maintain an "apples-to-apples" comparison. For example, if the agency uses a home-based VMT for the threshold, it should also be use home-based VMT for calculating project VMT and VMT reduction due to mitigation measures.

Recommended threshold for office projects: A proposed project exceeding a level of 15 percent below existing regional VMT per employee may indicate a significant transportation impact.

Office projects that would generate vehicle travel exceeding 15 percent below existing VMT per employee for the region may indicate a significant transportation impact. In cases where the region is substantially larger than the geography over which most workers would be expected to live, it might be appropriate to refer to a smaller geography, such as the county, that includes the area over which nearly all workers would be expected to live.

Office VMT screening maps can be developed using tour-based data, considering either total employee VMT or employee work tour VMT. Similarly, tour-based analysis of office project VMT could consider either total employee VMT or employee work tour VMT. Where tour-based information is unavailable for threshold determination, project assessment, or assessment of mitigation, home-based work trip VMT should be used throughout all steps of the analysis to maintain an "apples-to-apples" comparison.

Recommended threshold for retail projects: A net increase in total VMT may indicate a significant transportation impact.

Because new retail development typically redistributes shopping trips rather than creating new trips,[30] estimating the total change in VMT (i.e., the difference in total VMT in the area affected with and without the project) is the best way to analyze a retail project's transportation impacts.

By adding retail opportunities into the urban fabric and thereby improving retail destination proximity, local-serving retail development tends to shorten trips and reduce VMT. Thus, lead agencies generally may presume such development creates a less-than-significant transportation impact. Regional-serving retail development, on the other hand, which can lead to substitution of longer trips for shorter ones, may tend to have a significant impact. Where such development decreases VMT, lead agencies should consider the impact to be less-than-significant.

Many cities and counties define local-serving and regional-serving retail in their zoning codes. Lead agencies may refer to those local definitions when available, but should also consider any project-

[29] See Appendix 1 for a description of these approaches.
[30] Lovejoy, et al. (2013) *Measuring the impacts of local land-use policies on vehicle miles of travel: The case of the first big-box store in Davis, California, The Journal of Transport and Land Use*.

specific information, such as market studies or economic impacts analyses that might bear on customers' travel behavior. Because lead agencies will best understand their own communities and the likely travel behaviors of future project users, they are likely in the best position to decide when a project will likely be local-serving. Generally, however, retail development including stores larger than 50,000 square feet might be considered regional-serving, and so lead agencies should undertake an analysis to determine whether the project might increase or decrease VMT.

Mixed-Use Projects

Lead agencies can evaluate each component of a mixed-use project independently and apply the significance threshold for each project type included (e.g., residential and retail). Alternatively, a lead agency may consider only the project's dominant use. In the analysis of each use, a project should take credit for internal capture. Combining different land uses and applying one threshold to those land uses may result in an inaccurate impact assessment.

Other Project Types

Of land use projects, residential, office, and retail projects tend to have the greatest influence on VMT. For that reason, OPR recommends the quantified thresholds described above for purposes of analysis and mitigation. Lead agencies, using more location-specific information, may develop their own more specific thresholds, which may include other land use types. In developing thresholds for other project types, or thresholds different from those recommended here, lead agencies should consider the purposes described in section 21099 of the Public Resources Code and regulations in the CEQA Guidelines on the development of thresholds of significance (e.g., CEQA Guidelines, § 15064.7).

Strategies and projects that decrease local VMT but increase total VMT should be avoided. Agencies should consider whether their actions encourage development in a less travel-efficient location by limiting development in travel-efficient locations.

Redevelopment Projects

Where a project replaces existing VMT-generating land uses, if the replacement leads to a net overall decrease in VMT, the project would lead to a less-than-significant transportation impact. If the project leads to a net overall increase in VMT, then the thresholds described above should apply.

As described above, a project or plan near transit which replaces affordable[31] residential units with a smaller number of moderate- or high-income residential units may increase overall VMT, because

[31] Including naturally-occurring affordable residential units.

displaced residents' VMT may increase.[32] A lead agency should analyze VMT for such a project even if it otherwise would have been presumed less than significant. The assessment should incorporate an estimate of the aggregate VMT increase experienced by displaced residents. That additional VMT should be included in the numerator of the VMT per capita assessed for the project.

If a residential or office project leads to a net increase in VMT, then the project's VMT per capita (residential) or per employee (office) should be compared to thresholds recommended above. Per capita and per employee VMT are efficiency metrics, and, as such, apply only to the existing project without regard to the VMT generated by the previously existing land use.

If the project leads to a net increase in provision of locally-serving retail, transportation impacts from the retail portion of the development should be presumed to be less than significant. If the project consists of regionally-serving retail, and increases overall VMT compared to with existing uses, then the project would lead to a significant transportation impact.

RTP/SCS Consistency (All Land Use Projects)

Section 15125, subdivision (d), of the CEQA Guidelines provides that lead agencies should analyze impacts resulting from inconsistencies with regional plans, including regional transportation plans. For this reason, if a project is inconsistent with the Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS), the lead agency should evaluate whether that inconsistency indicates a significant impact on transportation. For example, a development may be inconsistent with an RTP/SCS if the development is outside the footprint of development or within an area specified as open space as shown in the SCS.

3. Recommendations Regarding Land Use Plans

As with projects, agencies should analyze VMT outcomes of land use plans across the full area over which the plan may substantively affect travel patterns, including beyond the boundary of the plan or jurisdiction's geography. And as with projects, VMT should be counted in full rather than split between origin and destination. (Emissions inventories have sometimes spit cross-boundary trips in order to sum to a regional total, but CEQA requires accounting for the full impact without truncation or discounting). Analysis of specific plans may employ the same thresholds described above for projects. A general plan, area plan, or community plan may have a significant impact on transportation if proposed new residential, office, or retail land uses would in aggregate exceed the respective thresholds recommended above. Where the lead agency tiers from a general plan EIR pursuant to CEQA Guidelines sections 15152 and 15166, the lead agency generally focuses on the environmental impacts that are specific to the later project and were not analyzed as significant impacts in the prior EIR. (Pub. Resources Code, § 21068.5; Guidelines, § 15152, subd. (a).) Thus, in analyzing the later project, the lead agency

[32] Chapple et al. (2017) *Developing a New Methodology for Analyzing Potential Displacement,* Chapter 4, pp. 159-160, available at https://www.arb.ca.gov/research/apr/past/13-310.pdf.

would focus on the VMT impacts that were not adequately addressed in the prior EIR. In the tiered document, the lead agency should continue to apply the thresholds recommended above.

Thresholds for plans in non-MPO areas may be determined on a case-by-case basis.

4. Other Considerations

Rural Projects Outside of MPOs

In rural areas of non-MPO counties (i.e., areas not near established or incorporated cities or towns), fewer options may be available for reducing VMT, and significance thresholds may be best determined on a case-by-case basis. Note, however, that clustered small towns and small town main streets may have substantial VMT benefits compared to isolated rural development, similar to the transit oriented development described above.

Impacts to Transit

Because criteria for determining the significance of transportation impacts must promote "the development of multimodal transportation networks" pursuant to Public Resources Code section 21099, subd. (b)(1), lead agencies should consider project impacts to transit systems and bicycle and pedestrian networks. For example, a project that blocks access to a transit stop or blocks a transit route itself may interfere with transit functions. Lead agencies should consult with transit agencies as early as possible in the development process, particularly for projects that are located within one half mile of transit stops.

When evaluating impacts to multimodal transportation networks, lead agencies generally should not treat the addition of new transit users as an adverse impact. An infill development may add riders to transit systems and the additional boarding and alighting may slow transit vehicles, but it also adds destinations, improving proximity and accessibility. Such development also improves regional vehicle flow by adding less vehicle travel onto the regional network.

Increased demand throughout a region may, however, cause a cumulative impact by requiring new or additional transit infrastructure. Such impacts may be adequately addressed through a fee program that fairly allocates the cost of improvements not just to projects that happen to locate near transit, but rather across a region to all projects that impose burdens on the entire transportation system, since transit can broadly improve the function of the transportation system.

F. Considering the Effects of Transportation Projects on Vehicle Travel

Many transportation projects change travel patterns. A transportation project which leads to additional vehicle travel on the roadway network, commonly referred to as "induced vehicle travel," would need to quantify the amount of additional vehicle travel in order to assess air quality impacts, greenhouse gas emissions impacts, energy impacts, and noise impacts. Transportation projects also are required to

examine induced growth impacts under CEQA. (See generally, Pub. Resources Code, §§ 21065 [defining "project" under CEQA as an activity as causing either a direct or reasonably foreseeable indirect physical change], 21065.3 [defining "project-specific effect" to mean all direct or indirect environmental effects], 21100, subd. (b) [required contents of an EIR].) For any project that increases vehicle travel, explicit assessment and quantitative reporting of the amount of additional vehicle travel should not be omitted from the document; such information may be useful and necessary for a full understanding of a project's environmental impacts. (See Pub. Resources Code, §§ 21000, 21001, 21001.1, 21002, 21002.1 [discussing the policies of CEQA].) A lead agency that uses the VMT metric to assess the transportation impacts of a transportation project may simply report that change in VMT as the impact. When the lead agency uses another metric to analyze the transportation impacts of a roadway project, changes in amount of vehicle travel added to the roadway network should still be analyzed and reported.[33]

While CEQA does not require perfection, it is important to make a reasonably accurate estimate of transportation projects' effects on vehicle travel in order to make reasonably accurate estimates of GHG emissions, air quality emissions, energy impacts, and noise impacts. (See, e.g., *California Clean Energy Com. v. City of Woodland* (2014) 225 Cal.App.4th 173, 210 [EIR failed to consider project's transportation energy impacts]; *Ukiah Citizens for Safety First v. City of Ukiah* (2016) 248 Cal.App.4th 256, 266.) Appendix 2 describes in detail the causes of induced vehicle travel, the robust empirical evidence of induced vehicle travel, and how models and research can be used in conjunction to quantitatively assess induced vehicle travel with reasonable accuracy.

If a project would likely lead to a measurable and substantial increase in vehicle travel, the lead agency should conduct an analysis assessing the amount of vehicle travel the project will induce. Project types that would likely lead to a measurable and substantial increase in vehicle travel generally include:

- Addition of through lanes on existing or new highways, including general purpose lanes, HOV lanes, peak period lanes, auxiliary lanes, or lanes through grade-separated interchanges

Projects that would not likely lead to a substantial or measurable increase in vehicle travel, and therefore generally should not require an induced travel analysis, include:

- Rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets (e.g., highways; roadways; bridges; culverts; Transportation Management System field elements such as cameras, message signs, detection, or signals; tunnels; transit systems; and assets that serve bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity
- Roadside safety devices or hardware installation such as median barriers and guardrails

[33] See, e.g., California Department of Transportation (2006) *Guidance for Preparers of Growth-related, Indirect Impact Analyses*, available at http://www.dot.ca.gov/ser/Growth-related_IndirectImpactAnalysis/GRI_guidance06May_files/gri_guidance.pdf.

- Roadway shoulder enhancements to provide “breakdown space,” dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes
- Addition of an auxiliary lane of less than one mile in length designed to improve roadway safety
- Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left, right, and U-turn pockets, two-way left turn lanes, or emergency breakdown lanes that are not utilized as through lanes
- Addition of roadway capacity on local or collector streets provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit
- Conversion of existing general purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel
- Addition of a new lane that is permanently restricted to use only by transit vehicles
- Reduction in number of through lanes
- Grade separation to separate vehicles from rail, transit, pedestrians or bicycles, or to replace a lane in order to separate preferential vehicles (e.g., HOV, HOT, or trucks) from general vehicles
- Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features
- Installation of traffic metering systems, detection systems, cameras, changeable message signs and other electronics designed to optimize vehicle, bicycle, or pedestrian flow
- Timing of signals to optimize vehicle, bicycle, or pedestrian flow
- Installation of roundabouts or traffic circles
- Installation or reconfiguration of traffic calming devices
- Adoption of or increase in tolls
- Addition of tolled lanes, where tolls are sufficient to mitigate VMT increase
- Initiation of new transit service
- Conversion of streets from one-way to two-way operation with no net increase in number of traffic lanes
- Removal or relocation of off-street or on-street parking spaces
- Adoption or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)
- Addition of traffic wayfinding signage
- Rehabilitation and maintenance projects that do not add motor vehicle capacity
- Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way
- Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve non-motorized travel
- Installation of publicly available alternative fuel/charging infrastructure
- Addition of passing lanes, truck climbing lanes, or truck brake-check lanes in rural areas that do not increase overall vehicle capacity along the corridor

1. Recommended Significance Threshold for Transportation Projects

As noted in Section 15064.3 of the CEQA Guidelines, lead agencies for roadway capacity projects have discretion, consistent with CEQA and planning requirements, to choose which metric to use to evaluate transportation impacts. This section recommends considerations for evaluating impacts using vehicle miles traveled. Lead agencies have discretion to choose a threshold of significance for transportation projects as they do for other types of projects. As explained above, Public Resources Code section 21099, subdivision (b)(1), provides that criteria for determining the significance of transportation impacts must promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses. (*Id.*; see generally, adopted CEQA Guidelines, § 15064.3, subd. (b) [Criteria for Analyzing Transportation Impacts].) With those goals in mind, OPR prepared and the Agency adopted an appropriate transportation metric.

Whether adopting a threshold of significance, or evaluating transportation impacts on a case-by-case basis, a lead agency should ensure that the analysis addresses:

- Direct, indirect and cumulative effects of the transportation project (CEQA Guidelines, § 15064, subds. (d), (h))
- Near-term and long-term effects of the transportation project (CEQA Guidelines, §§ 15063, subd. (a)(1), 15126.2, subd. (a))
- The transportation project's consistency with state greenhouse gas reduction goals (Pub. Resources Code, § 21099)[34]
- The impact of the transportation project on the development of multimodal transportation networks (Pub. Resources Code, § 21099)
- The impact of the transportation project on the development of a diversity of land uses (Pub. Resources Code, § 21099)

The CARB Scoping Plan and the CARB Mobile Source Strategy delineate VMT levels required to achieve legally mandated GHG emissions reduction targets. A lead agency should develop a project-level threshold based on those VMT levels, and may apply the following approach:

1. Propose a fair-share allocation of those budgets to their jurisdiction (e.g., by population);

[34] The California Air Resources Board has ascertained the limits of VMT growth compatible with California containing greenhouse gas emissions to levels research shows would allow for climate stabilization. (See *The 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Target* (p. 78, p. 101); *Mobile Source Strategy* (p. 37).) CARB's *Updated Final Staff Report on Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets* illustrates that the current Regional Transportation Plans and Sustainable Communities Strategies will fall short of achieving the necessary on-road transportation-related GHG emissions reductions called for in the 2017 Scoping Plan (Figure 3, p. 35). Accordingly, OPR recommends not basing GHG emissions or transportation impact analysis for a transportation project solely on consistency with an RTP/SCS.

2. Determine the amount of VMT growth likely to result from background population growth, and subtract that from their "budget";
3. Allocate their jurisdiction's share between their various VMT-increasing transportation projects, using whatever criteria the lead agency prefers.

2. Estimating VMT Impacts from Transportation Projects

CEQA requires analysis of a project's potential growth-inducing impacts. (Pub. Resources Code, § 21100, subd. (b)(5); CEQA Guidelines, § 15126.2, subd. (d).) Many agencies are familiar with the analysis of growth inducing impacts associated with water, sewer, and other infrastructure. This technical advisory addresses growth that may be expected from roadway expansion projects.

Because a roadway expansion project can induce substantial VMT, incorporating quantitative estimates of induced VMT is critical to calculating both transportation and other impacts of these projects. Induced travel also has the potential to reduce or eliminate congestion relief benefits. An accurate estimate of induced travel is needed to accurately weigh costs and benefits of a highway capacity expansion project.

The effect of a transportation project on vehicle travel should be estimated using the "change in total VMT" method described in *Appendix 1*. This means that an assessment of total VMT without the project and an assessment with the project should be made; the difference between the two is the amount of VMT attributable to the project. The assessment should cover the full area in which driving patterns are expected to change. As with other types of projects, the VMT estimation should not be truncated at a modeling or jurisdictional boundary for convenience of analysis when travel behavior is substantially affected beyond that boundary.

Transit and Active Transportation Projects

Transit and active transportation projects generally reduce VMT and therefore are presumed to cause a less-than-significant impact on transportation. This presumption may apply to all passenger rail projects, bus and bus rapid transit projects, and bicycle and pedestrian infrastructure projects. Streamlining transit and active transportation projects aligns with each of the three statutory goals contained in SB 743 by reducing GHG emissions, increasing multimodal transportation networks, and facilitating mixed use development.

Roadway Projects

Reducing roadway capacity (for example, by removing or repurposing motor vehicle travel lanes) will generally reduce VMT and therefore is presumed to cause a less-than-significant impact on transportation. Generally, no transportation analysis is needed for such projects.

Building new roadways, adding roadway capacity in congested areas, or adding roadway capacity to areas where congestion is expected in the future, typically induces additional vehicle travel. For the types of projects previously indicated as likely to lead to additional vehicle travel, an estimate should be made of the change in vehicle travel resulting from the project.

For projects that increase roadway capacity, lead agencies can evaluate induced travel quantitatively by applying the results of existing studies that examine the magnitude of the increase of VMT resulting from a given increase in lane miles. These studies estimate the percent change in VMT for every percent change in miles to the roadway system (i.e., "elasticity").[35] Given that lead agencies have discretion in choosing their methodology, and the studies on induced travel reveal a range of elasticities, lead agencies may appropriately apply professional judgment in studying the transportation effects of a particular project. The most recent major study, estimates an elasticity of 1.0, meaning that every percent change in lane miles results in a one percent increase in VMT.[36]

To estimate VMT impacts from roadway expansion projects:

1. Determine the total lane-miles over an area that fully captures travel behavior changes resulting from the project (generally the region, but for projects affecting interregional travel look at all affected regions).
2. Determine the percent change in total lane miles that will result from the project.
3. Determine the total existing VMT over that same area.
4. Multiply the percent increase in lane miles by the existing VMT, and then multiply that by the elasticity from the induced travel literature:

[% increase in lane miles] x [existing VMT] x [elasticity] = [VMT resulting from the project]

A National Center for Sustainable Transportation tool can be used to apply this method: https://ncst.ucdavis.edu/research/tools

This method would not be suitable for rural (non-MPO) locations in the state which are neither congested nor projected to become congested. It also may not be suitable for a new road that provides new connectivity across a barrier (e.g., a bridge across a river) if it would be expected to substantially

[35] See U.C. Davis, Institute for Transportation Studies (Oct. 2015) *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*; Boarnet and Handy (Sept. 2014) *Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions*, California Air Resources Board Policy Brief, available at https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf.
[36] See Duranton and Turner (2011) *The Fundamental Law of Road Congestion: Evidence from US cities*, available at http://www.nber.org/papers/w15376.

shorten existing trips. If it is likely to be substantial, the trips-shortening effect should be examined explicitly.

The effects of roadway capacity on vehicle travel can also be applied at a programmatic level. For example, in a regional planning process the lead agency can use that program-level analysis to streamline later project-level analysis. (See CEQA Guidelines, § 15168.) A program-level analysis of VMT should include effects of the program on land use patterns, and the VMT that results from those land use effects. In order for a program-level document to adequately analyze potential induced demand from a project or program of roadway capacity expansion, lead agencies cannot assume a fixed land use pattern (i.e., a land use pattern that does not vary in response to the provision of roadway capacity). A proper analysis should account for land use investment and development pattern changes that react in a reasonable manner to changes in accessibility created by transportation infrastructure investments (whether at the project or program level).

Mitigation and Alternatives

Induced VMT has the potential to reduce or eliminate congestion relief benefits, increase VMT, and increase other environmental impacts that result from vehicle travel.[37] If those effects are significant, the lead agency will need to consider mitigation or alternatives. In the context of increased travel that is induced by capacity increases, appropriate mitigation and alternatives that a lead agency might consider include the following:

- Tolling new lanes to encourage carpools and fund transit improvements
- Converting existing general purpose lanes to HOV or HOT lanes
- Implementing or funding off-site travel demand management
- Implementing Intelligent Transportation Systems (ITS) strategies to improve passenger throughput on existing lanes

Tolling and other management strategies can have the additional benefit of preventing congestion and maintaining free-flow conditions, conferring substantial benefits to road users as discussed above.

G. Analyzing Other Impacts Related to Transportation

While requiring a change in the methodology of assessing transportation impacts, Public Resources Code section 21099 notes that this change "does not relieve a public agency of the requirement to analyze a project's potentially significant transportation impacts related to air quality, noise, safety, or any other impact associated with transportation." OPR expects that lead agencies will continue to

[37] See National Center for Sustainable Transportation (Oct. 2015) *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*, available at http://www.dot.ca.gov/newtech/researchreports/reports/2015/10-12-2015-NCST_Brief_InducedTravel_CS6_v3.pdf; see Duranton and Turner (2011) *The Fundamental Law of Road Congestion: Evidence from US cities*, available at http://www.nber.org/papers/w15376.

address mobile source emissions in the air quality and noise sections of an environmental document and the corresponding studies that support the analysis in those sections. Lead agencies should continue to address environmental impacts of a proposed project pursuant to CEQA's requirements, using a format that is appropriate for their particular project.

Because safety concerns result from many different factors, they are best addressed at a programmatic level (i.e., in a general plan or regional transportation plan) in cooperation with local governments, metropolitan planning organizations, and, where the state highway system is involved, the California Department of Transportation. In most cases, such an analysis would not be appropriate on a project-by-project basis. Increases in traffic volumes at a particular location resulting from a project typically cannot be estimated with sufficient accuracy or precision to provide useful information for an analysis of safety concerns. Moreover, an array of factors affect travel demand (e.g., strength of the local economy, price of gasoline), causing substantial additional uncertainty. Appendix B of OPR's General Plan Guidelines summarizes research which could be used to guide a programmatic analysis under CEQA. Lead agencies should note that automobile congestion or delay does not constitute a significant environmental impact (Pub. Resources Code, §21099(b)(2)), and safety should not be used as a proxy for road capacity.

H. VMT Mitigation and Alternatives

When a lead agency identifies a significant impact, it must identify feasible mitigation measures that could avoid or substantially reduce that impact. (Pub. Resources Code, § 21002.1, subd. (a).) Additionally, CEQA requires that an environmental impact report identify feasible alternatives that could avoid or substantially reduce a project's significant environmental impacts.

Indeed, the California Court of Appeal recently held that a long-term regional transportation plan was deficient for failing to discuss an alternative which could significantly reduce total vehicle miles traveled. In *Cleveland National Forest Foundation v. San Diego Association of Governments, et al.* (2017) 17 Cal.App.5th 413, the court found that omission "inexplicable" given the lead agency's "acknowledgment in its Climate Action Strategy that the state's efforts to reduce greenhouse gas emissions from on-road transportation will not succeed if the amount of driving, or vehicle miles traveled, is not significantly reduced." (*Cleveland National Forest Foundation*, *supra*, 17 Cal.App.5th at p. 436.) Additionally, the court noted that the project alternatives focused primarily on congestion relief even though "the [regional] transportation plan is a long-term and congestion relief is not necessarily an effective long-term strategy." (*Id.* at p. 437.) The court concluded its discussion of the alternatives analysis by stating: "Given the acknowledged long-term drawbacks of congestion relief alternatives, there is not substantial evidence to support the EIR's exclusion of an alternative focused primarily on significantly reducing vehicle trips." (*Ibid*.)

Several examples of potential mitigation measures and alternatives to reduce VMT are described below. However, the selection of particular mitigation measures and alternatives are left to the discretion of

the lead agency, and mitigation measures may vary, depending on the proposed project and significant impacts, if any. Further, OPR expects that agencies will continue to innovate and find new ways to reduce vehicular travel.

Potential measures to reduce vehicle miles traveled include, but are not limited to:

- Improve or increase access to transit.
- Increase access to common goods and services, such as groceries, schools, and daycare.
- Incorporate affordable housing into the project.
- Incorporate neighborhood electric vehicle network.
- Orient the project toward transit, bicycle and pedestrian facilities.
- Improve pedestrian or bicycle networks, or transit service.
- Provide traffic calming.
- Provide bicycle parking.
- Limit or eliminate parking supply.
- Unbundle parking costs.
- Provide parking cash-out programs.
- Implement roadway pricing.
- Implement or provide access to a commute reduction program.
- Provide car-sharing, bike sharing, and ride-sharing programs.
- Provide transit passes.
- Shifting single occupancy vehicle trips to carpooling or vanpooling, for example providing ride-matching services.
- Providing telework options.
- Providing incentives or subsidies that increase the use of modes other than single-occupancy vehicle.
- Providing on-site amenities at places of work, such as priority parking for carpools and vanpools, secure bike parking, and showers and locker rooms.
- Providing employee transportation coordinators at employment sites.
- Providing a guaranteed ride home service to users of non-auto modes.

Notably, because VMT is largely a regional impact, regional VMT-reduction programs may be an appropriate form of mitigation. In lieu fees have been found to be valid mitigation where there is both a commitment to pay fees and evidence that mitigation will actually occur. (*Save Our Peninsula Committee v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 140-141; *Gentry v. City of Murrieta* (1995) 36 Cal.App.4th 1359; *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 727–728.) Fee programs are particularly useful to address cumulative impacts. (CEQA Guidelines, § 15130, subd. (a)(3) [a "project's incremental contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact"].) The mitigation program must undergo CEQA evaluation, either on the program as a whole, or the in-lieu fees or other mitigation must be evaluated

on a project-specific basis. (*California Native Plant Society v. County of El Dorado* (2009) 170 Cal.App.4th 1026.) That CEQA evaluation could be part of a larger program, such as a regional transportation plan, analyzed in a Program EIR. (CEQA Guidelines, § 15168.)

Examples of project alternatives that may reduce vehicle miles traveled include, but are not limited to:

- Locate the project in an area of the region that already exhibits low VMT.
- Locate the project near transit.
- Increase project density.
- Increase the mix of uses within the project or within the project's surroundings.
- Increase connectivity and/or intersection density on the project site.
- Deploy management strategies (e.g., pricing, vehicle occupancy requirements) on roadways or roadway lanes.

Appendix 1. Considerations About Which VMT to Count

Consistent with the obligation to make a good faith effort to disclose the environmental consequences of a project, lead agencies have discretion to choose the most appropriate methodology to evaluate project impacts.[38] A lead agency can evaluate a project's effect on VMT in numerous ways. The purpose of this document is to provide technical considerations in determining which methodology may be most useful for various project types.

Background on Estimating Vehicle Miles Traveled

Before discussing specific methodological recommendations, this section provides a brief overview of modeling and counting VMT, including some key terminology.

Here is an illustrative example of some methods of estimating vehicle miles traveled. Consider the following hypothetical travel day (all by automobile):

1. Residence to Coffee Shop
2. Coffee Shop to Work
3. Work to Sandwich Shop
4. Sandwich Shop to Work
5. Work to Residence
6. Residence to Store
7. Store to Residence

Trip-based assessment of a project's effect on travel behavior counts VMT from individual trips to and from the project. It is the most basic, and traditionally the most common, method of counting VMT. A trip-based VMT assessment of the residence in the above example would consider segments 1, 5, 6 and 7. For residential projects, the sum of home-based trips is called *home-based* VMT.

A *tour-based* assessment counts the entire home-back-to-home tour that includes the project. A tour-based VMT assessment of the residence in the above example would consider segments 1, 2, 3, 4, and 5 in one tour, and 6 and 7 in a second tour. A tour-based assessment of the workplace would include segments 1, 2, 3, 4, and 5. Together, all tours comprise *household* VMT.

[38] The California Supreme Court has explained that when an agency has prepared an environmental impact report:

> [T]he issue is not whether the [lead agency's] studies are irrefutable or whether they could have been better. The relevant issue is only whether the studies are sufficiently credible to be considered as part of the total evidence that supports the [lead agency's] finding[.]

(*Laurel Heights Improvement Assn. v. Regents of the University of California* (1988) 47 Cal.3d 376, 409; see also *Eureka Citizens for Responsible Gov't v. City of Eureka* (2007) 147 Cal.App.4th 357, 372.)

Both trip- and tour-based assessments can be used as measures of transportation efficiency, using denominators such as per capita, per employee, or per person-trip.

Trip- and Tour-based Assessment of VMT

As illustrated above, a tour-based assessment of VMT is a more complete characterization of a project's effect on VMT. In many cases, a project affects travel behavior beyond the first destination. The location and characteristics of the home and workplace will often be the main drivers of VMT. For example, a residential or office development located near high quality transit will likely lead to some commute trips utilizing transit, affecting mode choice on the rest of the tour.

Characteristics of an office project can also affect an employee's VMT beyond the work tour. For example, a workplace located at the urban periphery, far from transit, can require an employee to own a car, which in turn affects the entirety of an employee's travel behavior and VMT. For this reason, when estimating the effect of an office development on VMT, it may be appropriate to consider total employee VMT if data and tools, such as tour-based models, are available. This is consistent with CEQA's requirement to evaluate both direct and *indirect* effects of a project. (See CEQA Guidelines, § 15064, subd. (d)(2).)

Assessing Change in Total VMT

A third method, estimating the *change in total VMT* with and without the project, can evaluate whether a project is likely to divert existing trips, and what the effect of those diversions will be on total VMT. This method answers the question, "What is the net effect of the project on area VMT?" As an illustration, assessing the total change in VMT for a grocery store built in a food desert that diverts trips from more distant stores could reveal a net VMT reduction. The analysis should address the full area over which the project affects travel behavior, even if the effect on travel behavior crosses political boundaries.

Using Models to Estimate VMT

Travel demand models, sketch models, spreadsheet models, research, and data can all be used to calculate and estimate VMT (see Appendix F of the preliminary discussion draft). To the extent possible, lead agencies should choose models that have sensitivity to features of the project that affect VMT. Those tools and resources can also assist in establishing thresholds of significance and estimating VMT reduction attributable to mitigation measures and project alternatives. When using models and tools for those various purposes, agencies should use comparable data and methods, in order to set up an "apples-to-apples" comparison between thresholds, VMT estimates, and VMT mitigation estimates.

Models can work together. For example, agencies can use travel demand models or survey data to estimate existing trip lengths and input those into sketch models such as CalEEMod to achieve more

accurate results. Whenever possible, agencies should input localized trip lengths into a sketch model to tailor the analysis to the project location. However, in doing so, agencies should be careful to avoid double counting if the sketch model includes other inputs or toggles that are proxies for trip length (e.g., distance to city center). Generally, if an agency changes any sketch model defaults, it should record and report those changes for transparency of analysis. Again, trip length data should come from the same source as data used to calculate thresholds to be sure of an "apples-to-apples" comparison.

Additional background information regarding travel demand models is available in the California Transportation Commission's "2010 Regional Transportation Plan Guidelines," beginning at page 35.

Appendix 2. Induced Travel: Mechanisms, Research, and Additional Assessment Approaches

Induced travel occurs where roadway capacity is expanded in an area of present or projected future congestion. The effect typically manifests over several years. Lower travel times make the modified facility more attractive to travelers, resulting in the following trip-making changes:

- **Longer trips.** The ability to travel a long distance in a shorter time increases the attractiveness of destinations that are farther away, increasing trip length and vehicle travel.
- **Changes in mode choice.** When transportation investments are devoted to reducing automobile travel time, travelers tend to shift toward automobile use from other modes, which increases vehicle travel.
- **Route changes.** Faster travel times on a route attract more drivers to that route from other routes, which can increase or decrease vehicle travel depending on whether it shortens or lengthens trips.
- **Newly generated trips.** Increasing travel speeds can induce additional trips, which increases vehicle travel. For example, an individual who previously telecommuted or purchased goods on the internet might choose to accomplish those tasks via automobile trips as a result of increased speeds.
- **Land Use Changes.** Faster travel times along a corridor lead to land development farther along that corridor; that new development generates and attracts longer trips, which increases vehicle travel. Over several years, this induced growth component of induced vehicle travel can be substantial, making it critical to include in analyses.

Each of these effects has implications for the total amount of vehicle travel. These effects operate over different time scales. For example, changes in mode choice might occur immediately, while land use changes typically take a few years or longer. CEQA requires lead agencies to analyze both short-term and long-term effects.

Evidence of Induced Vehicle Travel. A large number of peer reviewed studies[39] have demonstrated a causal link between highway capacity increases and VMT increases. Many provide quantitative estimates of the magnitude of the induced VMT phenomenon. Collectively, they provide high quality evidence of the existence and magnitude of the induced travel effect.

[39] See, e.g., Boarnet and Handy (Sept. 2014) Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions, California Air Resources Board Policy Brief, available at https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf; National Center for Sustainable Transportation (Oct. 2015) *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*, available at http://www.dot.ca.gov/research/researchreports/reports/2015/10-12-2015-NCST_Brief_InducedTravel_CS6_v3.pdf.

Most of these studies express the amount of induced vehicle travel as an "elasticity," which is a multiplier that describes the additional vehicle travel resulting from an additional lane mile of roadway capacity added. For example, an elasticity of 0.6 would signify an 0.6 percent increase in vehicle travel for every 1.0 percent increase in lane miles. Many of these studies distinguish "short run elasticity" (increase in vehicle travel in the first few years) from "long run elasticity" (increase in vehicle travel beyond the first few years). Long run elasticity is larger than short run elasticity, because as time passes, more of the components of induced vehicle travel materialize. Generally, short run elasticity can be thought of as excluding the effects of land use change, while long run elasticity includes them. Most studies find a long run elasticity between 0.6 and just over 1.0,[40] meaning that every increase in lanes miles of one percent leads to an increase in vehicle travel of 0.6 to 1.0 percent. The most recent major study finds the elasticity of vehicle travel by lanes miles added to be 1.03; in other words, each percent increase in lane miles results in a 1.03 percent increase in vehicle travel.[41] (An elasticity greater than 1.0 can occur because new lanes induce vehicle travel that spills beyond the project location.) In CEQA analysis, the long-run elasticity should be used, as it captures the full effect of the project rather than just the early-stage effect.

Quantifying Induced Vehicle Travel Using Models. Lead agencies can generally achieve the most accurate assessment of induced vehicle travel resulting from roadway capacity increasing projects by applying elasticities from the academic literature, because those estimates include vehicle travel resulting from induced land use. If a lead agency chooses to use a travel demand model, additional analysis would be needed to account for induced land use. This section describes some approaches to undertaking that additional analysis.

Proper use of a travel demand model can capture the following components of induced VMT:

- Trip length (generally increases VMT)
- Mode shift (generally shifts from other modes toward automobile use, increasing VMT)
- Route changes (can act to increase or decrease VMT)
- Newly generated trips (generally increases VMT)
    - Note that not all travel demand models have sensitivity to this factor, so an off-model estimate may be necessary if this effect could be substantial.

However, estimating long-run induced VMT also requires an estimate of the project's effects on land use. This component of the analysis is important because it has the potential to be a large component of

[40] See Boarnet and Handy (Sept. 2014) *Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions*, California Air Resources Board Policy Brief, p. 2, available at https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf.

[41] Duranton and Turner (2011) *The Fundamental Law of Road Congestion: Evidence from US cities*, available at http://www.nber.org/papers/w15376.

the overall induced travel effect. Options for estimating and incorporating the VMT effects that are caused by the subsequent land use changes include:

1. *Employ an expert panel.* An expert panel could assess changes to land use development that would likely result from the project. This assessment could then be analyzed by the travel demand model to assess effects on vehicle travel. Induced vehicle travel assessed via this approach should be verified using elasticities found in the academic literature.
2. *Adjust model results to align with the empirical research.* If the travel demand model analysis is performed without incorporating projected land use changes resulting from the project, the assessed vehicle travel should be adjusted upward to account for those land use changes. The assessed VMT after adjustment should fall within the range found in the academic literature.
3. *Employ a land use model, running it iteratively with a travel demand model.* A land use model can be used to estimate the land use effects of a roadway capacity increase, and the traffic patterns that result from the land use change can then be fed back into the travel demand model. The land use model and travel demand model can be iterated to produce an accurate result.

A project which provides new connectivity across a barrier, such as a new bridge across a river, may provide a shortened path between existing origins and destinations, thereby shortening existing trips. In rare cases, this trip-shortening effect might be substantial enough to reduce the amount of vehicle travel resulting from the project below the range found in the elasticities in the academic literature, or even lead a net reduction in vehicle travel overall. In such cases, the trip-shortening effect could be examined explicitly.

Whenever employing a travel demand model to assess induced vehicle travel, any limitation or known lack of sensitivity in the analysis that might cause substantial errors in the VMT estimate (for example, model insensitivity to one of the components of induced VMT described above) should be disclosed and characterized, and a description should be provided on how it could influence the analysis results. A discussion of the potential error or bias should be carried into analyses that rely on the VMT analysis, such as greenhouse gas emissions, air quality, energy, and noise.

Attachment 3

LSA

GUIDELINES FOR EVALUATING VEHICLE MILES TRAVELED UNDER CEQA

for the
COUNTY OF ORANGE

AUGUST 7, 2020

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GUIDELINES FOR EVALUATING VEHICLE MILES TRAVELED UNDER CEQA

COUNTY OF ORANGE

Submitted to:

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Project No. OCY1701.19

August 2020

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LIST OF ABBREVIATIONS AND ACRONYMS

ADT	average daily trips
CalEEMod	California Emissions Estimator Model
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CO_2e	carbon dioxide equivalent
County	County of Orange
EO	Executive Order
FAR	floor-to-area ratio
Guidelines	2020 *State CEQA Guidelines*, 14 California Code of Regulations, Section 15000, et. seq.
GWP	global warming potential
HOT	high-occupancy toll
HOV	high-occupancy vehicle
HQTA	High-Quality Transit Area
LOS	level of service
LRTP	Long-Range Transportation Plan
mi	mile
MT	metric ton
MPO	Metropolitan Planning Organizations
OCTAM	Orange County Transportation Analysis Model
OPR	Governor's Office of Planning and Research

PRC	Public Resources Code
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
RTPA	Regional Transportation Planning Agency
SB	Senate Bill
SCAG	Southern California Association of Government
SOC	Statement of Overriding Considerations
TA	Technical Advisory
TDM	transportation demand management
TPA	Transit Priority Area
TSP	Transit Signal Priority
VMT	vehicle miles traveled

1.0 INTRODUCTION

Senate Bill (SB) 743, signed in 2013, changed the way transportation studies are conducted in California Environmental Quality Act (CEQA) documents. Vehicle miles traveled (VMT) replaces motorist delay and level of service (LOS) as the metric for impact determination. For land development projects, VMT is simply the product of the daily trips generated by a new development and the distance those trips travel to their destinations. For capital projects, impacts are identified as the new VMT attributable to the added capital project, both from the installation of the facility and the induced growth.

This document serves as a guide for application and substantial evidence for the County of Orange's (County) adopted project screenings, significance thresholds, and mitigation strategies, modeled after the Governor's Office of Planning and Research's (OPR) Technical Advisory (TA) for CEQA transportation studies; however, as in previous CEQA practice, the applicant/project proponent will still be required to provide traffic analysis that is specific to the proposed project to be reviewed and approved by the County. These guidelines apply to all projects for which the County is the Lead Agency for certification or adoption of CEQA documents. If the County is the Lead Agency, but the project is located in another jurisdiction, these guidelines would apply. However, if the County is not the Lead Agency, and the project is located in another jurisdiction, the Lead Agency would determine which VMT guidelines should be used for analysis.

In January 2019, the Natural Resources Agency and the OPR codified SB 743 into the Public Resources Code (PRC) and the *State CEQA Guidelines*.

The *State CEQA Guidelines*, included in Title 14 of the California Code of Regulations, Section 15064.3 subdivision (b)—hereafter referred to as the Guidelines—states the following criteria for analyzing transportation impacts:

1. **Land Use Projects.** Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.

2. **Transportation Projects.** Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent that such impacts have already been adequately addressed at a programmatic level, such as in a regional transportation plan EIR, a lead agency may tier from that analysis as provided in Section 15152.

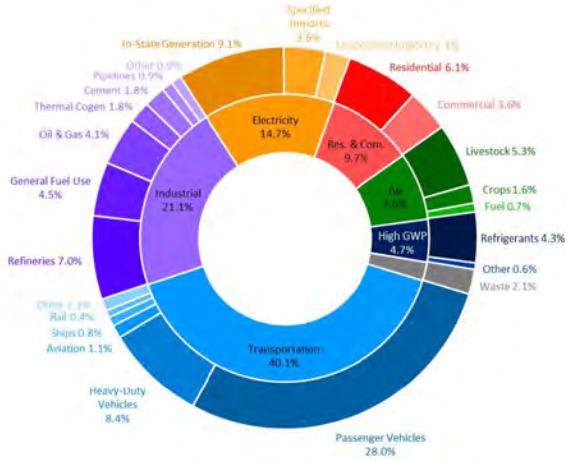
3. **Qualitative Analysis.** If existing models or methods are not available to estimate the vehicle miles traveled for the particular project being considered, a lead County may analyze the project's vehicle miles traveled qualitatively. Such a qualitative analysis would evaluate factors

such as the availability of transit, proximity to other destinations, etc. For many projects, a qualitative analysis of construction traffic may be appropriate.

4. **Methodology.** A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household, or in any other measure. A lead agency may use models to estimate a project's vehicle miles traveled, and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revisions to model outputs should be documented and explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section.

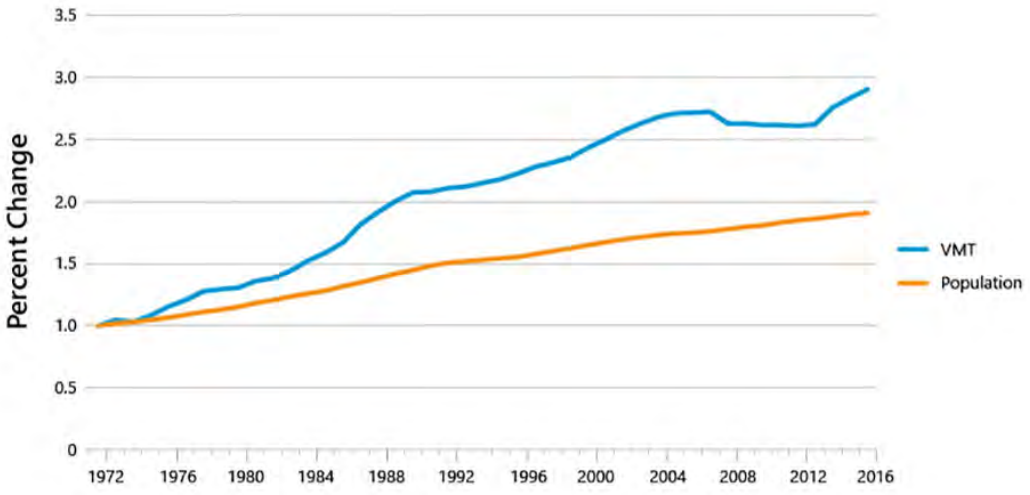
The OPR provides a TA (see Appendix A) as a guidance document to establish thresholds under this new VMT metric. The laws and rules governing the CEQA process are contained in the CEQA statute (PRC Section 21000 and following), the Guidelines (California Code of Regulations, Title 14, Section 15000 and following), published court decisions interpreting CEQA, and locally adopted CEQA procedures. The TA is intended as a reference document; it does not have the weight of law, but is intended by OPR to provide substantial evidence for the thresholds proposed therein. Thus, deviating from the TA is best undertaken with substantial evidence to support the County action.

The State of California has committed to reducing greenhouse gas (GHG) emissions and achieving long-term climate change goals. To achieve these climate change goals, the State has determined that overall VMT needs to be reduced. As Figure 1 shows, transportation is the single largest sector contributing to the State's GHG emissions. More than 40 percent of the GHG emissions come from the transportation sector, primarily passenger cars and light-duty trucks. According to the State, removing these vehicle trips and/or reducing the length of existing trips is expected to result in reduced VMT and reduced GHG emissions. As illustrated in Figure 2, over the last 40 years, VMT has grown faster than population growth. According to the OPR and the State, the new Guidelines and the establishment of VMT thresholds for CEQA analyses are linked to GHG reduction strategies and overall statewide climate change goals.



Source: California Greenhouse Gas Emissions for 2000 to 2017 Trends of Emissions and Other Indicators (California Air Resources Board Report)

Figure 1: 2017 GHG Emissions in California by Scoping Plan Sector and Sub-Sector Category

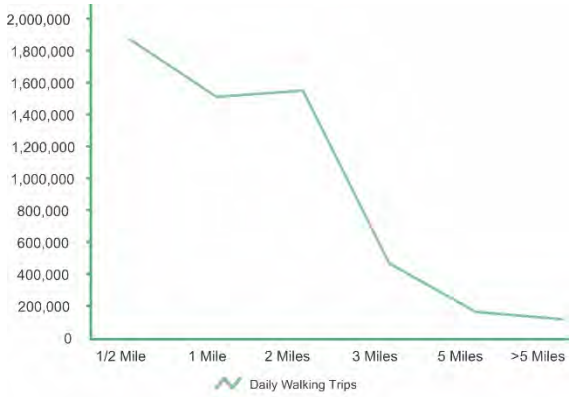


Source: https://ca50million.ca.gov/transportation/

Figure 2: California Statewide Population and VMT Trends

The State and the Southern California Association of Governments (SCAG), the metropolitan planning organization for Southern California, have provided guidance that the number of vehicle trips and the length of vehicle trips can be reduced by locating new development near available transit and a mix of other land uses. This is one example of a strategy to reduce project related VMT. SB 743 is intended to promote infill development, encourage multimodal transportation networks, and reduce GHG emissions.

In one example, SCAG's Draft Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) (SCAG 2019) includes data showing that the number of walking trips greatly diminishes for distances longer than 2 miles (Figure 3). If a person's destination or a transit station are within 2 miles of a person's home, the person may choose a non-vehicle travel mode.



Sources: SCAG Connect Socal: The 2020-2045 RTP/SCS Active Transportation Technical Appendix, Page 30; California Household Travel Survey (2012).

Figure 3: SCAG Region Total Number of Daily Walking Trips by Distance

This document provides a guide for application and substantial evidence for the County's adopted thresholds of significance, modeled after OPR's suggestions, for CEQA transportation studies. It is divided into chapters, including:

- **Chapter 2 – Definition of Region:** Here, the document describes what the comparative region is for analysis purposes. Each project will be compared to an existing regional average. The geographical area that defines the region is defined and described.

- **Chapter 3 – Project Screening:** This chapter provides criteria, and, where applicable, substantial evidence for screening out certain types of projects that, by their nature, or by virtue of other factors, would result in less than significant transportation impacts. This is consistent with the OPR's acknowledgment that certain projects are either low VMT generators, or by virtue of their location would have a less than significant impact.

- **Chapter 4 – Significance Thresholds for Land Development Projects:** In this chapter, the threshold that would define a significant CEQA impact for land use projects is identified. This threshold is linked to a specific travel mode and a set of trip purposes. The actual VMT metric (either an efficiency rate or total VMT) is described.

- **Chapter 5 – Significant Thresholds for Transportation Projects:** This chapter describes the method to evaluate significant CEQA impacts associated with transportation projects. Many non-vehicular capital projects are presumed to have a less than significant impact. Capacity-enhancing projects may have significant impacts and will be subject to a detailed analysis that will include measuring induced travel.

- **Chapter 6 – Significance Thresholds for Land Plans:** This chapter provides guidance and substantial evidence to support the County's treatment of land use plans and their CEQA transportation analysis.

- **Chapter 7 – Mitigation Strategies:** This chapter provides examples of potential mitigation strategies. It is noted that this discussion does not present an exhaustive list of feasible mitigation measures that may be applied to a project. As in previous CEQA practice, the applicant/project proponent will be required to identify mitigation measures to reduce, avoid, or offset the specific project-related impacts identified in an individual environmental document.

2.0 DEFINITION OF REGION: VEHICLE MILES TRAVELED CONTEXT AND DETERMINING THE BASELINE

The question of context defines the scope of the VMT analysis. The common term for this in previous delay-based LOS analyses is ***project study area***. In the delay-based LOS analyses, a project study area is generally determined based on the incremental increase in traffic from the project and its potential to create a significant LOS impact. This generally includes intersections and roadway segments where the project would add a prescribed number of peak-hour trips. Many times, lead agencies stop study area boundaries at their jurisdictional borders.

Based on the evidence and analysis provided below, the "Region" for Orange County is the entire county area.

Region is not defined in the TA. Instead, the OPR offers the following suggestions:

> *In cases where the region is substantially larger than the geography over which most workers would be expected to live, it might be appropriate to refer to a smaller geography, such as **county**, that includes the area over which nearly all workers would be expected to live (page 16).*
>
> 1. *For residential projects in unincorporated county areas, the local County can compare a residential project's VMT to (1) the region's VMT per capita, or (2) the aggregate population weighted VMT per capita of all cities in the region.*

The TA bases recommendations for thresholds for the primary land use types (residential and office) on a comparison to a ***regional average***. The County will utilize the region's VMT per capita approach. The OPR guidance recommends consistency in approach; once a region is established, that region should be used for all subsequent traffic analyses.

Other large or urbanized areas around the State have been surveyed to identify what region has been established for VMT thresholds. In most cases, the county boundary has been identified as the region selected for VMT analysis. In some cases, this county boundary has other names, such as the Council of Governments boundary.

County is a common and reoccurring context for CEQA VMT analyses throughout the State. According to the Orange County Transportation Analysis Model (OCTAM 5.0), of the total trips in and out of Orange County, about 21 percent originate and are destined within the unincorporated county area. Another 67 percent of trips originate or are destined within the municipal jurisdictions (cities) in Orange County. The remaining 12 percent of Orange County trips have a trip end in the other counties of the SCAG region or beyond. Because the majority of the unincorporated county trips are contained within the entirety of Orange County (approximately 88 percent) and many other large urbanized areas are defining their region as their counties, the use of Orange County in its entirety is defined as the region for CEQA land development transportation analyses.

Table A: County of Orange Unincorporated Vehicle Miles Traveled Data (Using OCTAM Base Year 2016)

Table 1 - San Diego Trips

Region	Total Trips	Trips to/from San Diego	Percent San Diego Trips
Unincorporated Orange County	668,689	3,165	0.5%
Total Orange County (including unincorporated Orange)	19,004,260	69,830	0.4%

Table 2 - Percent County of Orange Trips with Orange County as region

Trips within Unincorporated Orange County + Trips between Unincorporated and Incorporated Orange County	525,288
Total Trips within Entire Orange County (Internal - Internal)	8,559,626
Percent County of Orange Trips within Orange County	**6.1%**

Table 3 - Percent County of Orange Trips with Orange County + 10 mile buffer as region

Trips within Unincorporated Orange County + Trips between Unincorporated and Incorporated Orange County, and 10-mile buffer around Orange County (parts of LA, Riverside, and San Bernadino County)	575,922
Total Trips within Entire Orange County + 10-Mile Buffer around Orange County (Internal - Internal)	14,800,711
Percent County of Orange Trips within Orange County + 10-mile Buffer	**3.9%**

Table 3a - Percent County of Orange Trips with Orange County + 10 mile buffer as region

Total Trips to/from Entire Orange County (includes unincorporated Orange County + external trips)	9,451,544
Trips within Entire Modeling area (Orange, LA, Ventura, Riverside, and San Bernadino Counties + External Stations)	48,342,620
Percent Orange County Trips in Entire Modeling Area	**19.6%**

Table 4 - VMT Per Capita

Region	Total Homebased VMT	Total Household Population	VMT/Capita
Unincorporated Orange County	3,477,242	145,121	24.0
Total Orange County (including unincorporated Orange)	56,757,571	3,179,626	17.9
Total Orange County + Part LA, Riverside, and SB Counties (10 miles from county boundary)	116,115,946	6,241,508	18.6

Table 5 - VMT Per Employee

Region	Total Homebased Work VMT	Total Employment	VMT/Employee
Unincorporated Orange County	1,348,364	33,312	40.5
Total Orange County (including unincorporated Orange)	41,174,971	1,710,147	24.1
Total Orange County + Part LA, Riverside, and SB Counties (10 miles from county boundary)	66,768,783	2,766,068	24.1

Source: OCTAM5 Base Year model run (2016)

It should be recognized the use of Orange County as the region defines the comparative (i.e., baseline), or the denominator, in the identification of project-related impact. The numerator is the project's VMT contribution. The project-related/generated VMT profile may go beyond the county boundary and not be truncated by a jurisdictional boundary. For example, a new, large land development proposed near Orange County's eastern boundary may include VMT from as far away as Corona or other communities in Riverside and San Bernardino counties. In that case, it would be the responsibility of the applicant and their traffic study preparer to include the project VMT, regardless of geographical limit, to the satisfaction of the County staff. This project-related VMT profile would be compared against the County regional baseline.

Unlike delay-based LOS analyses, VMT is a regional effect not defined by roadway, intersection, or pathway. The OPR acknowledges this in its TA (page 6), which states,

> *Lead agencies should not truncate any VMT analysis because of jurisdictional or other boundaries by failing to count the portion of a trip that falls outside the jurisdiction or by discounting the VMT from a trip that crosses a jurisdictional boundary.*

Table A is used as the current 2020 calculations to demonstrate what calculations should be applied. Tables 2, 4, and 5, in Table A identify the relevant VMT baselines for the region. These baselines will be revised as the OCTAM is revised beyond version 5.0. Applicants should use the most up-to-date version of the OCTAM in setting the baseline and analyzing their project.

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3.0 PROJECT SCREENING

The TA acknowledges that certain activities and projects may result in a less-than-significant impact to transportation and circulation. A variety of projects may be screened out of a complicated VMT analysis due to the presumption described in the TA regarding the occurrence of less-than-significant impacts.

3.1 Land Development Projects

The TA acknowledges that conditions may exist under which a land development project would have a less than significant impact on transportation and circulation. These may be size, location, proximity to transit, or trip-making potential.

Land development projects that have one or more of the following attributes may be presumed to create a less than significant impact on transportation and circulation.

- **Project in High-Quality Transit Area (HQTA):** The project is within 0.5 mile (mi) of a Transit Priority Area (TPA) or an HQTA, unless the project is inconsistent with the RTP/SCS, has a floor-to-area ratio (FAR) less than 0.75, provides an excessive amount of parking, or reduces the number of affordable residential units. In accordance with SB 743, "Transit priority areas" are defined as "an area within one-half mile of a major transit stop that is existing or planned, if the planned stop is scheduled to be completed within the planning horizon included in a Transportation Improvement Program. A Major Transit Stop means: "a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service of 15 minutes or less during the morning and afternoon peak commute periods." An HQTA or Corridor is a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.

  Figure 4 depicts TPAs within unincorporated Orange County[1], including HQTA corridors served by the Orange County Transportation Authority with service intervals of 15 minutes or less and major transit stops along the Metrolink[2] system. Although the figure shows the San Clemente Pier Metrolink station, it does not qualify as a major transit stop because service is limited to weekends. Projects proposed in these areas would be presumed to have a less than significant transportation impact unless the project is inconsistent with the RTP/SCS, has an FAR less than 0.75, provides an excessive amount of parking, or reduces the number of affordable residential units.

- **Neighborhood Retail Project:** The project involves local-serving retail space of less than 50,000 square feet.

- **Affordable Housing Project:** The project is 100 percent affordable-housing units.

1 Figure 4 may be updated periodically as necessary.
2 Amtrak runs along Metrolink's Orange County route and stops at many Orange County Metrolink stations.

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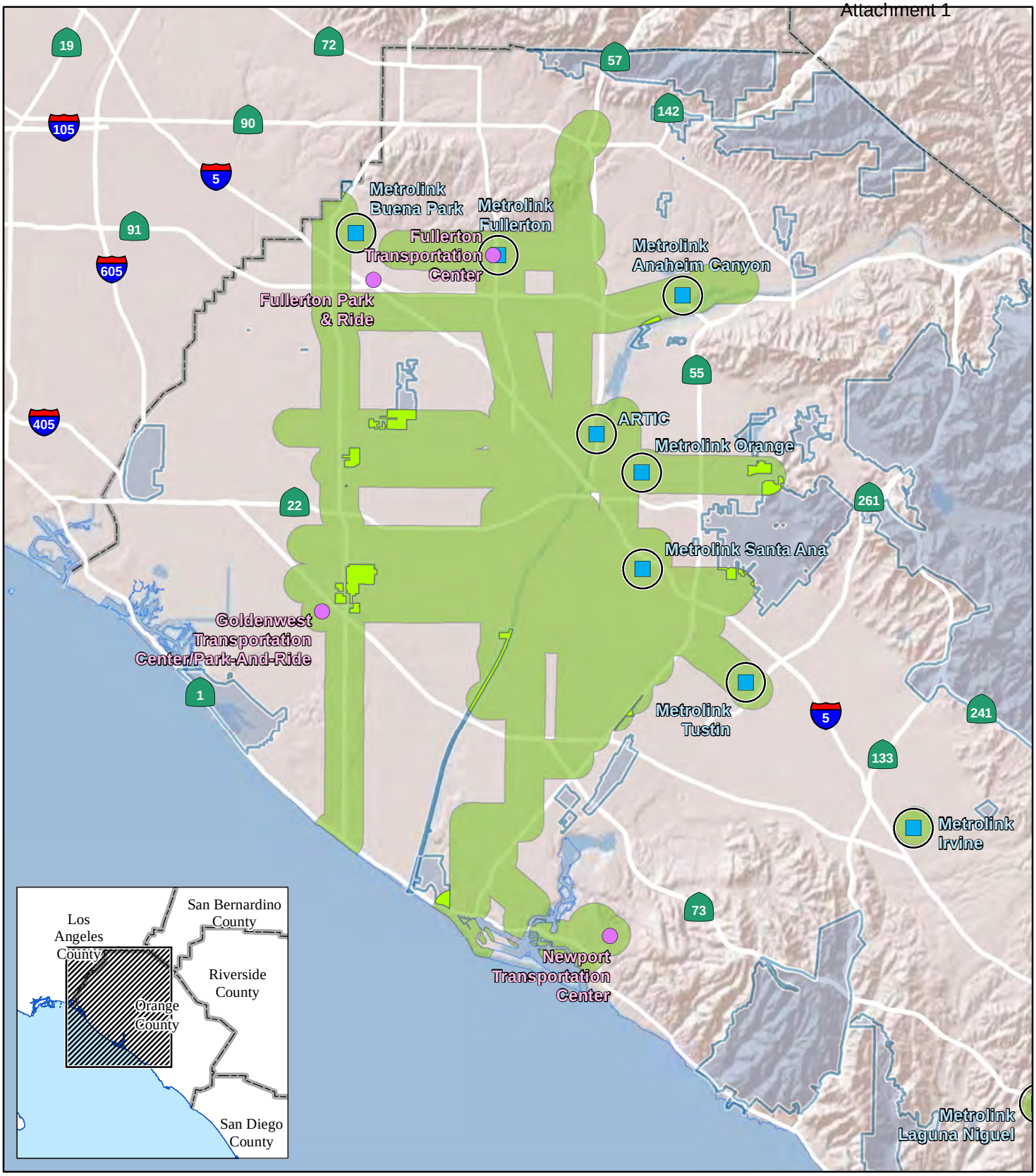

LSA

LEGEND

- Unincorporated Areas of Orange County
- High Quality Transit Areas
- Unincorporated Areas within High Quality Transit Areas
- Transportation Centers
- Metrolink Station (with half-mile buffer)

N

0 1.75 3.5
MILES

FIGURE 4
Sheet 1 of 2

CEQA Transportation Thresholds of Significance Guide

County of Orange Transit Priority Areas

SOURCE: OCPW (3/2020), SCAG (6/2019); OCTA (11/2019); Bing (2019)

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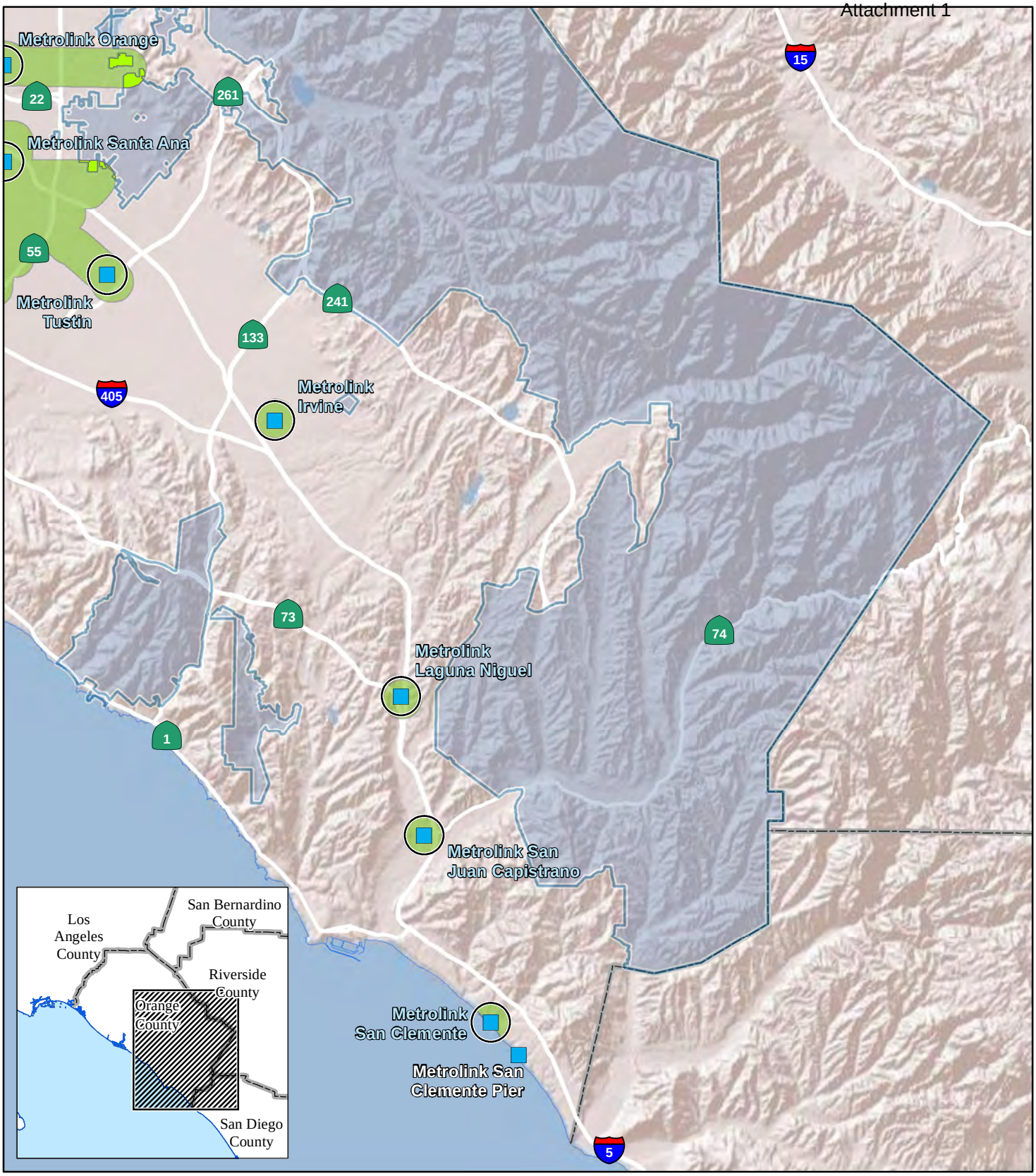

LSA

LEGEND

- Unincorporated Areas of Orange County
- High Quality Transit Areas
- Unincorporated Areas within High Quality Transit Areas
- Transportation Centers
- Metrolink Station (with half-mile buffer)

N

0 1.75 3.5
MILES

SOURCE: OCPW (3/2020), SCAG (6/2019); OCTA (11/2019); Bing (2019)

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FIGURE 4
Sheet 2 of 2

CEQA Transportation Thresholds of Significance Guide

County of Orange Transit Priority Areas

- **Low VMT Area[3] Project:** The project is in low VMT areas. The applicant may submit data from the most recent OCTAM version showing the proposed project is within a low VMT area, which may be used, at the discretion of staff, to screen out the project.

- **Small Project:** A project generates 500 or fewer average daily trips (ADT). The TA recommends a volume of 110 ADT as the low volume that would allow the project to be screened out. This recommendation is not based on any analysis of GHG reduction, but was instead based on the potential trip generation of an office project that would already be categorically exempt under CEQA. LSA prepared a deeper analysis and used the California Emissions Estimator Model (CalEEMod, version 2016.3.2) to correlate the effect of changes in project-related ADT to the resulting GHG emissions. This model was selected because it is provided by the California Air Resources Board (CARB) to be used statewide for determining project-level GHG emissions. CalEEMod was used with the built-in default trip lengths and types to show the vehicular GHG emissions from incremental amounts of ADT. Table B shows the resulting annual VMT and GHG emissions from the incremental ADT.

Table B: Representative Vehicle VMT and GHG Emissions from CalEEMod

Average Daily Trips	Annual Vehicle Miles Traveled	GHG Emissions (metric tons CO_2e per year)
200	683,430	258
300	1,021,812	386
400	1,386,416	514
500	1,703,020	643
600	2,043,623	771

Source: CalEEMod version 2016.3.2. Example project used: 50 single-family Homes in Orange County.
CalEEMod = California Emissions Estimator Model
CO_2e = carbon dioxide equivalent
GHG = greenhouse gas

A common GHG emissions threshold is 3,000 metric tons (MT) of carbon dioxide equivalent[4] (CO_2e) per year. Vehicle emissions are typically more than 50 percent of the total project GHG emissions. Thus, a project with 500 ADT would generally have total project emissions that could be less than 1,300 MT CO_2e/year (i.e., 50 percent or 643 MT CO_2e/year coming from vehicle emissions and the other 50 percent coming from other project activities). As this level of GHG

[3] Orange County's land area may be described in terms of low, medium and high VMT areas based on thresholds described in Chapter 4. These descriptions are Low: less 85 percent of the regional average; Medium: equal to or more than 85 percent of the regional average **and** less than or equal to 117 percent of regional average; and High: greater than 117 percent of regional average.

[4] Carbon dioxide equivalent (CO_2e) is a concept developed to provide one metric that includes the effects of numerous GHGs. The global warming potential (GWP) of each GHG characterizes the ability of each GHG to trap heat in the atmosphere relative to another GHG. The GWPs of all GHGs are combined to derive the CO_2e.

emissions would be less than 3,000 MT CO_2e/year, the emissions of GHG from a project up to 500 ADT would typically be less than significant.

The County's current Transportation Implementation Manual establishes screening criteria of 200 ADT. However, based on the analysis in Table B, projects with fewer than 500 ADT are unlikely to result in significant impacts.

Based on this qualitative analysis, the County establishes screening criteria for small projects of up to 500 ADT.

- **Public Facilities:** The development of institutional/government and public service uses that support community health, safety or welfare are also screened from subsequent CEQA VMT analysis. The following includes some examples and is not an exhaustive list of public facilities that are screened from subsequent CEQA VMT analysis: police/sheriff stations, fire stations, community centers, refuse stations, jails, and landfills. These facilities are already part of the community and, as a public service, the VMT is accounted for in the existing regional average. Many of these facilities also generate fewer than 500 ADT and/or use vehicles other than passenger-cars or light duty trucks. These other vehicle fleets are subject to regulation outside of CEQA, such as CARB and the South Coast Air Quality Management District.

3.2 Transportation Projects

The primary attribute to consider with transportation projects is the potential to increase vehicle travel. While the County has discretion to continue to use delay analysis for CEQA disclosure of transportation projects, changes in vehicle travel must also be quantified.

The TA lists a series of projects that would not likely lead to a substantial or measurable increase in vehicle travel and that, therefore, would generally not require an induced travel analysis. The current list of projects, which is not intended to be exhaustive, includes the following examples:

- Rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets (e.g., highways; roadways; bridges; culverts; Transportation Management System field elements such as cameras, message signs, detection, or signals; tunnels; transit systems; and assets that serve bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity

- Roadside safety devices or hardware installation such median barriers and guardrails

- Roadway shoulder enhancements to provide "breakdown space," dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes

- Addition of an auxiliary lane of less than 1 mile in length designed to improve roadway safety

- Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left-, right-, and U-turn pockets, two-way left-turn lanes, or emergency breakdown lanes that are not utilized as through lanes
- Addition of roadway capacity on local or collector streets, provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit
- Conversion of existing general-purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel
- Addition of a new lane that is permanently restricted to use only by transit vehicles
- Reduction in the number of through lanes
- Grade separation to separate vehicles from rail, transit, pedestrians, or bicycles, or to replace a lane in order to separate preferential vehicles (e.g., high-occupancy vehicles [HOVs], high-occupancy toll [HOT] lane traffic, or trucks) from general vehicles
- Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features
- Installation of traffic metering systems, detection systems, cameras, changeable message signs, and other electronics designed to optimize vehicle, bicycle, or pedestrian flow
- Timing of signals to optimize vehicle, bicycle, or pedestrian flow
- Installation of roundabouts or traffic circles
- Installation or reconfiguration of traffic calming devices
- Adoption of or increase in tolls
- Addition of tolled lanes, where tolls are sufficient to mitigate VMT increase
- Initiation of a new transit service
- Conversion of streets from one-way to two-way operation with no net increase in the number of traffic lanes
- Removal or relocation of off-street or on-street parking spaces
- Adoption or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)
- Addition of traffic wayfinding signage

- Rehabilitation and maintenance projects that do not add motor vehicle capacity
- Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way
- Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve nonmotorized travel
- Installation of publicly available alternative fuel/charging infrastructure
- Addition of passing lanes, truck climbing lanes, or truck brake-check lanes in rural areas that do not increase overall vehicle capacity along the corridor

Additionally, transit and active transportation projects generally reduce VMT and are, therefore, presumed to cause a less than significant impact on transportation. This presumption may apply to all passenger rail projects, bus and bus rapid-transit projects, and bicycle and pedestrian infrastructure projects.

4.0 SIGNIFICANCE THRESHOLDS FOR LAND DEVELOPMENT PROJECTS

The TA states that SB 743 and all CEQA VMT transportation analyses refer to automobiles. Here, the term automobile refers to on-road passenger vehicles, specifically cars and light-duty trucks (page. 4). Heavy-duty trucks can be addressed in other CEQA sections and are subject to regulation in a separate collection of rules under CARB jurisdiction. This approach was amplified by Chris Ganson, Chief Planner at OPR in a recent presentation at the Fresno Council of Governments (October 23, 2019) and by Ellen Greenberg, California Department of Transportation (Caltrans) Deputy Director for Sustainability, at the San Joaquin Valley Regional Planning Association meeting (January 9, 2020).

The OPR has identified the subject of the thresholds as the primary trips in the home-based typology: specifically, home-based work trips. This includes residential uses, office uses, and retail uses. The home-based work trip type is the primary tripmaking during the peak hours of commuter traffic in the morning and evening periods.

The focus of analyzing transportation impacts has shifted from congestion to climate change, and the purpose of the CEQA analysis is to disclose and ultimately reduce GHG emissions by reducing the number and length of automobile trips. This change in CEQA analysis does not diminish the County's ability to require an LOS analysis to confirm accessibility to a project site, conformance with General Plan policies, or as a function of their general health, safety, and welfare discretion and authority. As part of the SB 375 land use/transportation integration process and the GHG goal setting, most metropolitan planning organizations and regional transportation planning agencies have agreed to reduce GHG through integrated land use and transportation planning by approximately 15 percent by 2035. Furthermore, in its 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals, the CARB recommends total VMT per capita rates approximately 15 percent below existing conditions.

The TA therefore recommends:

> *A proposed (residential) project exceeding a level of 15 percent below existing regional average VMT per capita may indicate a significant transportation impact.*
>
> *A similar threshold would apply to office projects (15 percent below existing regional average VMT per employee).*
>
> *VMT generated by retail projects would indicate a significant impact for any net increase in total VMT.*

While regional planning documents such as the RTP/SCS calculate a single VMT rate by dividing total VMT for the SCAG region by the total service population, it should be noted that the TA identifies a different denominator for the residential and office comparison rates. If regional average VMT per capita and VMT per employee were calculated using the service population (population plus employment), the denominator would be the same, which would be inconsistent with the TA. Furthermore, using service population to calculate regional average rates would complicate future project analyses.

The environmental document for a proposed land use project will identify population for a residential project and employment for an office project. These values should be used in the transportation analysis to calculate the project's VMT per capita or VMT per employee. If a project's VMT per capita (VMT/project population) or VMT per employee (VMT/project employment) is compared to a regional average based on service rate (VMT/[regional population + employment]), the comparison is not equivalent.

According to the Orange County Transportation Authority calculations using OCTAM 5.0, the average VMT/capita in Orange County is 17.9. The average VMT/employee in Orange County is 24.1.

Mixed-use projects should be evaluated for each component of the project independently, or the County may use the predominant land use type for the analysis. Credit for internal trip capture should be accounted for. No discrete land use types other than residential, office, or retail are identified for threshold development in the TA.

The TA suggests that the County may, but is not required to, develop thresholds for any other use. One approach is to review the County General Plan and/or Countywide Long-Range Transportation Plan (LRTP) and identify whether the implementation of the plan would result in a reduction of VMT and GHGs. If it does, the County may conclude the implementation of the plan, including all the other land use types to achieve the regional climate change goals. Therefore, consistency with the plan and no net change in VMT per employee is a rational threshold for the other land use types. This approach would require disclosure of substantial evidence, including the General Plan or LRTP findings, and other supporting traffic and air quality forecasting support.

4.1 Summary

In summary, the County's thresholds of significance for the following land uses are:

- **Residential –** 15 percent below existing regional average VMT per capita (17.9 X 0.85 = 15.2)
- **Office –** 15 percent below existing regional average VMT per employee (24.1 X 0.85 = 20.5)
- **Retail –** no net change in total VMT
- **Mixed Use:** consider each component of the project separately based on the threshold for residential, office, retail, etc. and take credit for internal capture
- **Other Land Uses –** no net change in VMT per employee if consistent with the General Plan or 15 percent below regional average if seeking a General Plan Amendment

Figure 5 demonstrates the potential land development entitlement process to comply with the Guidelines related to VMT and transportation impacts. It provides the path from application filing through determination of impacts. It is presented as the standard process; each development application is considered unique and may create alternative or modified steps through the process. Each step that diverges from this standard process should be accompanied with substantial

evidence demonstrating compliance with other climate change and GHG emission reduction laws and regulations.

4.2 Agency Communication

At the outset of the project development process, the applicant should seek a meeting with County staff to discuss the project description, the transportation study content, and the analysis methodology. Key elements to address include describing the project in sufficient detail to generate trips and identify the potential catchment area (i.e., trip lengths, if no modeling is being undertaken), estimating project VMT, discussing project design features that may reduce the VMT from the project development, and discussing the project location and associated existing regional VMT percentages. As a result of the meeting, the applicant or their consultant shall prepare a transportation analysis scope of work for review and approval by the County.

4.3 Project Screening

Once a development application is filed, project screening is conducted as the initial step. If the project meets any one of the screening criteria for VMT, the project may be presumed to create a less than significant impact in the area of transportation and circulation and no further analysis as to this topical environmental area is necessary. The CEQA document should enumerate the screening criteria and how the project meets or exceeds that threshold. If project screening does not apply, a VMT analysis may be required, in accordance with CEQA. The extent of this analysis may be a simple algebraic demonstration or a more sophisticated traffic modeling exercise.

4.4 Project VMT Analysis

The first step is to identify the project land use type and the appropriate efficiency rate to use. If the project is residential, use the per capita (or residential population) efficiency rate. If the project is commercial office (or a similar trip generator), use the per employee efficiency rate. For retail projects, use the total VMT generated by the project. For mixed use projects, report each land use after generating trips, taking credit for internal trip capture, to arrive at the VMT. As an alternative, the predominant use may be reported for mixed-use projects. For all other uses, use the VMT per employee as the comparative.

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Proposed Land Development
Project Application Received

PROJECT SCREENING CRITERIA

- Transit Priority Area
- High Quality Transit Corridor
- Local-serving Retail <50TSF
- Low Trip Generator <500ADT

NO

YES

Presumed Insignificant
Analysis Complete

IDENTIFICATION OF PROJECT VMT

- Per Capita Rate
- Per Employee Rate
- Total VMT

Residential

Office

Retail

Other

VMT PER CAPITA

VMT PER EMPLOYEE

TOTAL VMT

VMT PER EMPLOYEE

CONSISTENT WITH GENERAL PLAN

INCONSISTENT WITH GENERAL PLAN

IDENTIFICATION OF VMT THRESHOLD

(Existing and Cumulative)

85% OF EXISTING REGIONAL VMT

85% OF EXISTING REGIONAL VMT

NET INCREASE IN TOTAL VMT

INCREASE IN VMT RATE

85% OF EXISTING REGIONAL VMT RATE

MODELING AND ASSESSMENT OF IMPACT

LESS THAN OR GREATER THAN THRESHOLD?

Greater Than

Less Than

Less Than Significant Impact. Analysis Complete

A project that falls below an efficiency-based threshold that is aligned with long-term goals and relevant plans has no cumulative impact distinct from the project impact. Accordingly, a finding of less than significant project impact would imply a less than significant cumulative impact, and vice versa.

MITIGATION MEASURES

PROJECT SPECIFIC

- CAPCOA Green Bank
- CARB VMT Reduction
- Substantial Evidence

AREAWIDE REGIONAL FEE

Requires New Nexus Study

- Transit District
- JPA
- MPO

Do Measures Fully Mitigate Impact and Create No Additional Impact?

NO

YES

Additional Analysis
or
Significant Unmitigatable Impact
and Statement of Overriding Considerations

Analysis Complete

LSA

FIGURE 5

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4.4.1 Medium Project VMT Analysis

For medium-sized projects (projects generating greater than 500 ADT but less than 1,000 ADT) or those with one predominant use, the determination of project VMT may be identified manually as the product of the daily trip generation (land use density/intensity multiplied by the County-approved trip generation rates, usually the ITE Trip Generation Manual) and the trip length in miles for that specific land use. Trip lengths can be found in other related air quality tools, such as CalEEMod, or may be derived from OCTAM.

4.4.2 Large Project VMT Analysis

For large or multi-use projects, use of the OCTAM traffic forecasting tool is required. For purposes of County review, a project generating 1,000 ADT or more should use the OCTAM traffic forecasting tool. At this level of trip generating, the probability of trip fulfilment expands to an area greater than the immediate project location and may include a greater regional attraction. The OCTAM traffic forecasting tool can more accurately define the select links used and the total VMT generated by the project.

Next, the project generated efficiency rate, or total VMT, depending on project type, is compared to the appropriate significance threshold. **This is either 85 percent of the existing regional average per capita or employment (for the County) for residential and office uses, or no net increase in total VMT for retail or other uses that are consistent with the General Plan.** For those projects that require a General Plan Amendment, 85 percent of existing regional average is appropriate, as the project has yet to be evaluated as part of the County's ultimate land development vision.

If the project VMT (expressed as a per capita or per employee rate or total number) is at or less than the significance threshold, the project is presumed to create a less than significant impact. No further analysis is required. If the project is greater than the significance threshold, mitigation measures are required.

4.5 Mitigation Measures

The applicant is required, per CEQA, to identify feasible mitigation to mitigate the impact created by the project, to a level that is less than significant. Appendices A and B list some ideas for potential mitigation strategies. This is not an exhaustive list of feasible mitigation measures that may be applied to the project. As in previous CEQA practice, the applicant/project proponent will be required to identify mitigation measures to reduce, avoid, or offset the specific project-related impacts identified in an individual environmental document. Thus, the applicant should submit other creative, feasible mitigation for their project. The mitigation measures suggested and the related VMT percentage reduction must be reviewed and either approved or rejected by the County.

If the mitigation measures mitigate the project impact to a less than significant level, no further analysis is required. If the project's VMT impact cannot be fully mitigated, the County may: 1) request the project be redesigned, relocated, or realigned to reduce the VMT impact, or 2) prepare a Statement of Overriding Considerations (SOC) for the transportation impacts associated with the project. All feasible mitigation measures must be assigned to and carried out by the project, even if a SOC is prepared.

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5.0 SIGNIFICANCE THRESHOLDS FOR TRANSPORTATION PROJECTS

Section 15064.3.b.(2) of the Guidelines reads in part:

> *For roadway capacity projects, agencies have the discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements.*

The County may continue to use delay and LOS for transportation projects as long as impacts related to "other applicable requirements" are disclosed. This has generally been interpreted as VMT impacts and other State climate change objectives. These other applicable requirements may be found in other parts of an environmental document (i.e., air quality, GHG), or may be provided in greater detail in the transportation section.

For projects on the State highway system, Caltrans will use and will require sponsoring agencies to use VMT as the CEQA metric, and Caltrans will evaluate the VMT "attributable to the project" (Caltrans Draft VMT-Focused Transportation Impact Study Guide, February 28, 2020). Caltrans' Intergovernmental Review will review environmental documents for capacity-enhancing projects for the County's analysis of VMT change.

The assessment of a transportation project's VMT should disclose the VMT without the project and the difference in VMT with the project. According to the TA, any growth in VMT attributable to the transportation project would result in a significant impact.

The primary difference in these two scenarios (without the project and with the project) to OPR is related to induced growth. Current traffic models have limited abilities to forecast induced growth, as their land use or socioeconomic databases are fixed to a horizon date. OPR refers to a limited set of reports that would indicate elasticities. The most recent major study (Duranton & Turner 2011, p. 24) estimates an elasticity of 1.0, meaning that every 1 percent change in lane miles results in a 1 percent increase in VMT.

The TA presents one method to identify the induced growth, as shown below. This method may be used in Orange County to estimate induced growth attributable to new roadway capacity.

> *To estimate VMT impacts from roadway expansion projects:*
>
> 1. *Determine the total lane-miles over an area that fully captures travel behavior changes resulting from the project (generally the region, but for projects affecting interregional travel look at all affected regions).*
> 2. *Determine the percentage change in total lane miles that will result from the project.*
> 3. *Determine the total existing VMT over that same area.*
> 4. *Multiply the percentage increase in lane miles by the existing VMT, and then multiply that by the elasticity from the induced travel literature:*
>
> *[% increase in lane miles] x [existing VMT] x [elasticity] = [VMT resulting from the project]*

It should be pointed out that OPR assigns this induced growth to induced land use.

As an alternative method, Caltrans has identified a computerized tool that estimates VMT generation from transportation projects. It was developed at the University of California, Davis, and is based on elasticities and the relationship of lane mile additions and growth in VMT. It uses Federal Highway Administration definitions of facility type and ascribes VMT increases to each facility. Output includes increases on million vehicle miles per year. Caltrans is investigating its use for all its VMT analyses of capital projects. It is available for use by local agencies and applicants, and the County may recommend utilization of this tool for calculations.

The TA provides other options to identify induced growth- and project-related VMT. These include:

1. *Employ an expert panel. An expert panel could assess changes to land use development that would likely result from the project. This assessment could then be analyzed by the travel demand model to assess effects on vehicle travel. Induced vehicle travel assessed via this approach should be verified using elasticities found in the academic literature.*

2. Adjust model results to align with the empirical research. *If the travel demand model analysis is performed without incorporating projected land use changes resulting from the project, the assessed vehicle travel should be adjusted upward to account for those land use changes. The assessed VMT after adjustment should fall within the range found in the academic literature.*

3. Employ a land use model, running it iteratively with a travel demand model. *A land use model can be used to estimate the land use effects of a roadway capacity increase, and the traffic patterns that result from the land use change can then be fed back into the travel demand model. The land use model and travel demand model can be iterated to produce an accurate result.*

The TA provides additional guidance, below:

> *Whenever employing a travel demand model to assess induced vehicle travel, any limitation or known lack of sensitivity in the analysis that might cause substantial errors in the VMT estimate (for example, model insensitivity to one of the components of induced VMT described above) should be disclosed and characterized, and a description should be provided on how it could influence the analysis results. A discussion of the potential error or bias should be carried into analyses that rely on the VMT analysis, such as greenhouse gas emissions, air quality, energy, and noise.*

The threshold for significance for a capacity-enhancing roadway project is any additional VMT generated by the project either due to the increased roadway use or as a result of induced growth attributable to the project.

6.0 SIGNIFICANCE THRESHOLDS FOR LAND PLANS

In the TA, the OPR provided guidance on the treatment of CEQA traffic analyses for land use plans. The TA reiterates previous direction regarding individual land use assessments:

- Analyze the VMT outcomes over the full area over which the plan may substantively affect travel patterns (the definition of region).

- VMT should be counted in full rather than split between origins and destinations (the full impact of the project VMT).

The TA provides a single sentence as consideration for land use plans. It states, *"A general plan, area plan, or community plan may have a significant impact on transportation if proposed new residential, office or retail land uses would in aggregate exceed the respective thresholds recommended above."* This recommendation refers to 85 percent of the existing city or regional average, and no net gain for residential, office, and retail land uses.

OPR is recommending a focus on specific trip purposes (i.e., home-based trips for residential projects and work-based trips for office projects). Depending on the modeling platform, at least four other trip types are recognized as contributors to large-scale plan-level analyses. Home-based origins will have interactions with other non-work-based destinations. Therefore, if home-based trips are the focus of a plan-level assessment, a great deal of VMT would not be accounted for in the estimation of total VMT.

To assess a land plan, use of a traffic-forecasting tool is recommended. The total VMT for the plan should be identified for all trip types and all potential VMT contributors within the plan area. Similar traffic model runs should be conducted for the existing base year and the horizon year with No Project.

The SB 375 process and the Regional Targets Advisory Committee GHG goal setting has established a baseline GHG emissions reduction that local Metropolitan Planning Organizations (MPOs) and Regional Transportation Planning Agencies (RTPAs) can achieve. These achievements are provided in the integration of land use planning and transportation, not solely through the imposition of regulation on passenger cars and light-duty trucks. The CARB reviews the GHG reduction strategies and has approved the most recent round of GHG emission reductions for MPOs and RTPAs around the State.

Other legislative mandates and State policies speak to GHG reduction targets. A sample of these include:

- Assembly Bill 32 (2006) requires statewide GHG emissions reductions to 1990 levels by 2020 and continued reductions beyond 2020.

- SB 32 (2016) requires at least a 40 percent reduction in GHG emissions from 1990 levels by 2030.

- Executive Order (EO) B-30-15 (2015) sets a GHG emissions reduction target of 40 percent below 1990 levels by 2030.

- EO S-3-05 (2005) sets a GHG emissions reduction target of 80 percent below 1990 levels by 2050.

- EO B-16-12 (2012) specifies a GHG emissions reduction target of 80 percent below 1990 levels by 2050 specifically for transportation.

Guidelines Section 15064.3(b)(4) states (in part) the following:

> *A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household, or in any other measure.*

Therefore, the recommended methodology for conducting VMT assessments for land plans is to compare the existing VMT per capita for the land plan area with the expected horizon year VMT per service population (population and employment). The recommended target is to achieve a lower VMT per service population in the horizon year with the proposed land plan than occurs for the existing condition.

7.0 MITIGATION STRATEGIES

When a significant CEQA impact is identified according to the thresholds described above, the project proponent will be required to identify feasible mitigation measures in order to reduce, avoid, or offset the impact. Although previous vehicle LOS impacts could be mitigated with location-specific vehicle level of service improvements, VMT impacts likely require mitigation of regional impacts through more behavioral changes. Enforcement of mitigation measures will still be subject to the mitigation monitoring requirements of CEQA, as well as the regular police powers of the County. These measures can also be incorporated as a part of plans, policies, regulations, or project designs.

7.1 Definition of Mitigation

Section 15370 of the Guidelines defines mitigations as follows:

> *"Mitigation" includes:*
>
> *a. Avoiding the impact altogether by not taking a certain action or parts of an action.*
>
> *b. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.*
>
> *c. Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment.*
>
> *d. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.*
>
> *e. Compensating for the impact by replacing or providing substitute resources or environments, including through permanent protection of such resources in the form of conservation easements.*

Section 15097 of the Guidelines states that "the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it has imposed to mitigate or avoid significant environmental effects."

VMT mitigations are not necessarily physical improvements; rather, they are complex in nature and will significantly depend on changes in human behavior.

Section 21099 (b) (4) of the PRC states, "This subdivision [requiring a new transportation metric under CEQA] does not preclude the application of local general plan policies, zoning codes, conditions of approval, thresholds, or any other planning requirements pursuant to the police power or any other authority." Thus, despite the fact that automobile delay will no longer be considered a significant impact under CEQA, the County can still require projects to meet the LOS standards designated in its zoning code or general plan. Many projects will likely still be required to propose LOS improvements for congestion relief in addition to VMT strategies as CEQA mitigation measures.

7.2 Mitigation Measures and Project Alternatives

7.2.1 Land Development Projects and Community/General Plans

Mitigations and project alternatives for VMT impacts have been suggested by the OPR and are included in the TA. VMT mitigation can be extremely diverse and can be classified under several categories such as land use/location, road pricing, transit improvements, commute trip reduction strategies, and parking pricing/policy. Improvements related to VMT reduction strategies have been quantified in sources such as the California Air Pollution Control Officers Association (CAPCOA) report *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA Green Book) and CARB sources and are generally presented in wide ranges of potential VMT reduction percentages.

Appendix B provides a brief menu of the different potentially applicable VMT mitigation measures and project alternatives stated in the CAPCOA Green Book (only those strategies directly attributed to transportation) and the OPR TA for land development projects. This discussion does not present an exhaustive list of feasible mitigation measures that may be applied to a project. As in previous CEQA practice, the applicant/project proponent will be required to identify mitigation measures to the County to reduce, avoid, or offset the specific project-related impacts identified in an individual environmental document.

As additional mitigation measures are developed to offset VMT impacts in the future for the Guidelines process, linkages between the strategy and the incremental effect and quantified offset must be made. This can be based on other sources' observations and measurements or County experience in these practices. The key to mitigation is to base its efficacy on real and substantial evidence.

7.2.2 Transportation Projects

Although OPR provides detailed guidance on how to assess induced-growth impacts associated with transportation projects, it leaves the subject of mitigation measures vague. Only four strategies are suggested as mitigation measures:

- Tolling new lanes to encourage carpools and fund transit improvements
- Converting existing general-purpose lanes to HOV or HOT lanes
- Implementing or funding off-site travel demand management
- Implementing Intelligent Transportation Systems strategies to improve passenger throughput on existing lanes

No quantified reduction percentage is allocated to these strategies, and LSA could find no substantial evidence that would provide guidance to levels of significance after implementation of these strategies. Review of the four recommended strategies suggests that OPR is directing strategies away from general-purpose mixed-flow lanes on expressways, freeways, and arterial highways. Inasmuch as these are the project descriptions and Purpose and Need, the project intent and the project mitigation may be at odds. The County may be subject to an SOC for the capital project VMT impact.

APPENDIX A

TECHNICAL ADVISORY ON EVALUATING TRANSPORTATION IMPACTS IN CEQA (OPR, DECEMBER 2018)

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TECHNICAL ADVISORY

ON EVALUATING TRANSPORTATION IMPACTS IN CEQA

December 2018

Contents

A. Introduction

This technical advisory is one in a series of advisories provided by the Governor's Office of Planning and Research (OPR) as a service to professional planners, land use officials, and CEQA practitioners. OPR issues technical assistance on issues that broadly affect the practice of land use planning and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). (Gov. Code, § 65040, subds. (g), (l), (m).) The purpose of this document is to provide advice and recommendations, which agencies and other entities may use at their discretion. This document does not alter lead agency discretion in preparing environmental documents subject to CEQA. This document should not be construed as legal advice.

Senate Bill 743 (Steinberg, 2013), which was codified in Public Resources Code section 21099, required changes to the guidelines implementing CEQA (CEQA Guidelines) (Cal. Code Regs., Title 14, Div. 6, Ch. 3, § 15000 et seq.) regarding the analysis of transportation impacts. As one appellate court recently explained: "During the last 10 years, the Legislature has charted a course of long-term sustainability based on denser infill development, reduced reliance on individual vehicles and improved mass transit, all with the goal of reducing greenhouse gas emissions. Section 21099 is part of that strategy . . . ." (*Covina Residents for Responsible Development v. City of Covina* (2018) 21 Cal.App.5th 712, 729.) Pursuant to Section 21099, the criteria for determining the significance of transportation impacts must "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." (*Id.*, subd. (b)(1); see generally, adopted CEQA Guidelines, § 15064.3, subd. (b) [Criteria for Analyzing Transportation Impacts].) To that end, in developing the criteria, OPR has proposed, and the California Natural Resources Agency (Agency) has certified and adopted, changes to the CEQA Guidelines that identify vehicle miles traveled (VMT) as the most appropriate metric to evaluate a project's transportation impacts. With the California Natural Resources Agency's certification and adoption of the changes to the CEQA Guidelines, automobile delay, as measured by "level of service" and other similar metrics, generally no longer constitutes a significant environmental effect under CEQA. (Pub. Resources Code, § 21099, subd. (b)(3).)

This advisory contains technical recommendations regarding assessment of VMT, thresholds of significance, and mitigation measures. Again, OPR provides this Technical Advisory as a resource for the public to use at their discretion. OPR is not enforcing or attempting to enforce any part of the recommendations contained herein. (Gov. Code, § 65035 ["It is not the intent of the Legislature to vest in the Office of Planning and Research any direct operating or regulatory powers over land use, public works, or other state, regional, or local projects or programs."].)

This December 2018 technical advisory is an update to the advisory it published in April 2018. OPR will continue to monitor implementation of these new provisions and may update or supplement this advisory in response to new information and advancements in modeling and methods.

B. Background

VMT and Greenhouse Gas Emissions Reduction. Senate Bill 32 (Pavley, 2016) requires California to reduce greenhouse gas (GHG) emissions 40 percent below 1990 levels by 2030, and Executive Order B-16-12 provides a target of 80 percent below 1990 emissions levels for the transportation sector by 2050. The transportation sector has three major means of reducing GHG emissions: increasing vehicle efficiency, reducing fuel carbon content, and reducing the amount of vehicle travel. The California Air Resources Board (CARB) has provided a path forward for achieving these emissions reductions from the transportation sector in its 2016 Mobile Source Strategy. CARB determined that it will not be possible to achieve the State's 2030 and post-2030 emissions goals without reducing VMT growth. Further, in its 2018 Progress Report on California's Sustainable Communities and Climate Protection Act, CARB found that despite the State meeting its 2020 climate goals, "emissions from statewide passenger vehicle travel per capita [have been] increasing and going in the wrong direction," and "California cannot meet its [long-term] climate goals without curbing growth in single-occupancy vehicle activity."[1] CARB also found that "[w]ith emissions from the transportation sector continuing to rise despite increases in fuel efficiency and decreases in the carbon content of fuel, California will not achieve the necessary greenhouse gas emissions reductions to meet mandates for 2030 and beyond without significant changes to how communities and transportation systems are planned, funded, and built."[2]

Thus, to achieve the State's long-term climate goals, California needs to reduce per capita VMT. This can occur under CEQA through VMT mitigation. Half of California's GHG emissions come from the transportation sector[3], therefore, reducing VMT is an effective climate strategy, which can also result in co-benefits.[4] Furthermore, without early VMT mitigation, the state may follow a path that meets GHG targets in the early years, but finds itself poorly positioned to meet more stringent targets later. For example, in absence of VMT analysis and mitigation in CEQA, lead agencies might rely upon verifiable offsets for GHG mitigation, ignoring the longer-term climate change impacts resulting from land use development and infrastructure investment decisions. As stated in CARB's 2017 Scoping Plan:

> "California's future climate strategy will require increased focus on integrated land use planning to support livable, transit-connected communities, and conservation of agricultural and other lands. Accommodating population and economic growth through travel- and energy-efficient land use provides GHG-efficient growth, reducing GHGs from both transportation and building energy use. GHGs can be further reduced at the project level through implementing energy-efficient construction and travel demand management approaches."[5] (*Id.* at p. 102.)

[1] California Air Resources Board (Nov. 2018) *2018 Progress Report on California's Sustainable Communities and Climate Protection Act*, pp. 4, 5, available at https://ww2.arb.ca.gov/sites/default/files/2018-11/Final2018Report_SB150_112618_02_Report.pdf.
[2] *Id.*, p. 28.
[3] See https://ca50million.ca.gov/transportation/
[4] Fang et al. (2017) *Cutting Greenhouse Gas Emissions Is Only the Beginning: A Literature Review of the Co-Benefits of Reducing Vehicle Miles Traveled*.
[5] California Air Resources Board (Nov. 2017) *California's 2017 Climate Change Scoping Plan*, p. 102, available at https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf.

In light of this, the 2017 Scoping Plan describes and quantifies VMT reductions needed to achieve our long-term GHG emissions reduction goals, and specifically points to the need for statewide deployment of the VMT metric in CEQA:

> "Employing VMT as the metric of transportation impact statewide will help to ensure GHG reductions planned under SB 375 will be achieved through on-the-ground development, and will also play an important role in creating the additional GHG reductions needed beyond SB 375 across the State. Implementation of this change will rely, in part, on local land use decisions to reduce GHG emissions associated with the transportation sector, both at the project level, and in long-term plans (including general plans, climate action plans, specific plans, and transportation plans) and supporting sustainable community strategies developed under SB 375."[6]

VMT and Other Impacts to Health and Environment. VMT mitigation also creates substantial benefits (sometimes characterized as "co-benefits" to GHG reduction) in both in the near-term and the long-term. Beyond GHG emissions, increases in VMT also impact human health and the natural environment. Human health is impacted as increases in vehicle travel lead to more vehicle crashes, poorer air quality, increases in chronic diseases associated with reduced physical activity, and worse mental health. Increases in vehicle travel also negatively affect other road users, including pedestrians, cyclists, other motorists, and many transit users. The natural environment is impacted as higher VMT leads to more collisions with wildlife and fragments habitat. Additionally, development that leads to more vehicle travel also tends to consume more energy, water, and open space (including farmland and sensitive habitat). This increase in impermeable surfaces raises the flood risk and pollutant transport into waterways.[7]

VMT and Economic Growth. While it was previously believed that VMT growth was a necessary component of economic growth, data from the past two decades shows that economic growth is possible without a concomitant increase in VMT. (Figure 1.) Recent research shows that requiring development projects to mitigate LOS may actually reduce accessibility to destinations and impede economic growth.[8,9]

[6] *Id.* at p. 76.
[7] Fang et al. (2017) *Cutting Greenhouse Gas Emissions Is Only the Beginning: A Literature Review of the Co-Benefits of Reducing Vehicle Miles Traveled*, available at https://ncst.ucdavis.edu/wp-content/uploads/2017/03/NCST-VMT-Co-Benefits-White-Paper_Fang_March-2017.pdf.
[8] Haynes et al. (Sept. 2015) *Congested Development: A Study of Traffic Delays, Access, and Economic Activity in Metropolitan Los Angeles*, available at http://www.its.ucla.edu/wp-content/uploads/sites/6/2015/11/Haynes_Congested-Development_1-Oct-2015_final.pdf.
[9] Osman et al. (Mar. 2016) *Not So Fast: A Study of Traffic Delays, Access, and Economic Activity in the San Francisco Bay Area*, available at http://www.its.ucla.edu/wp-content/uploads/sites/6/2016/08/Taylor-Not-so-Fast-04-01-2016_final.pdf.

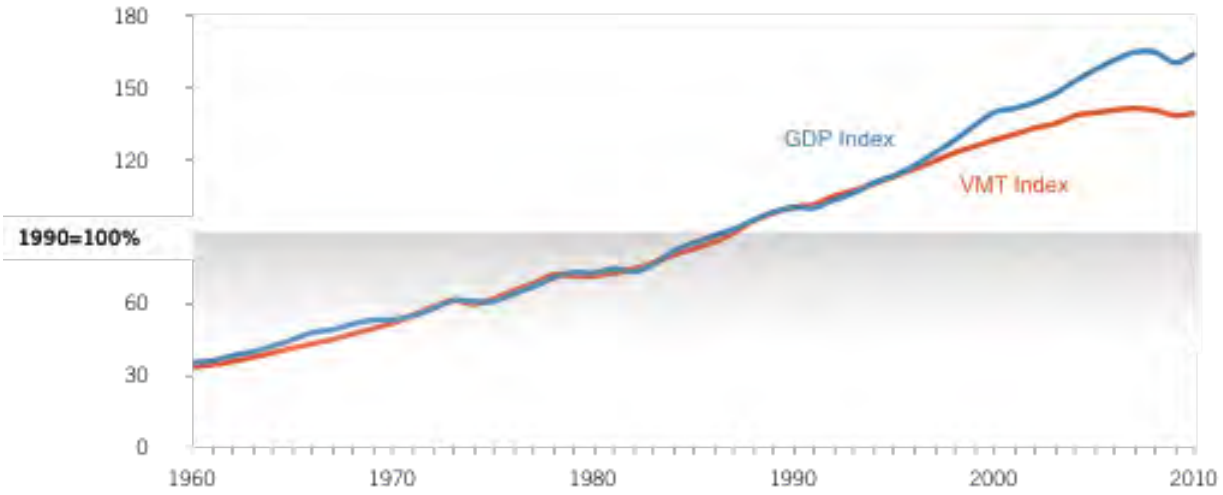

Figure 1. Kooshian and Winkelman (2011) *VMT and Gross Domestic Product (GDP), 1960-2010*.

C. Technical Considerations in Assessing Vehicle Miles Traveled

Many practitioners are familiar with accounting for VMT in connection with long-range planning, or as part of the CEQA analysis of a project's greenhouse gas emissions or energy impacts. This document provides technical information on how to assess VMT as part of a transportation impacts analysis under CEQA. Appendix 1 provides a description of which VMT to count and options on how to count it. Appendix 2 provides information on induced travel resulting from roadway capacity projects, including the mechanisms giving rise to induced travel, the research quantifying it, and information on additional approaches for assessing it.

1. Recommendations Regarding Methodology

Proposed Section 15064.3 explains that a "lead agency may use models to estimate a project's vehicle miles traveled . . . ." CEQA generally defers to lead agencies on the choice of methodology to analyze impacts. (*Santa Monica Baykeeper v. City of Malibu* (2011) 193 Cal.App.4th 1538, 1546; see *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 409 ["the issue is not whether the studies are irrefutable or whether they could have been better" … rather, the "relevant issue is only whether the studies are sufficiently credible to be considered" as part of the lead agency's overall evaluation].) This section provides suggestions to lead agencies regarding methodologies to analyze VMT associated with a project.

Vehicle Types. Proposed Section 15064.3, subdivision (a), states, "For the purposes of this section, 'vehicle miles traveled' refers to the amount and distance of automobile travel attributable to a project." Here, the term "automobile" refers to on-road passenger vehicles, specifically cars and light trucks. Heavy-duty truck VMT could be included for modeling convenience and ease of calculation (for example, where models or data provide combined auto and heavy truck VMT). For an apples-to-apples

comparison, vehicle types considered should be consistent across project assessment, significance thresholds, and mitigation.

Residential and Office Projects. Tour- and trip-based approaches[10] offer the best methods for assessing VMT from residential/office projects and for comparing those assessments to VMT thresholds. These approaches also offer the most straightforward methods for assessing VMT reductions from mitigation measures for residential/office projects. When available, tour-based assessment is ideal because it captures travel behavior more comprehensively. But where tour-based tools or data are not available for all components of an analysis, a trip-based assessment of VMT serves as a reasonable proxy.

Models and methodologies used to calculate thresholds, estimate project VMT, and estimate VMT reduction due to mitigation should be comparable. For example:

- A tour-based assessment of project VMT should be compared to a tour-based threshold, or a trip-based assessment to a trip-based VMT threshold.
- Where a travel demand model is used to determine thresholds, the same model should also be used to provide trip lengths as part of assessing project VMT.
- Where only trip-based estimates of VMT reduction from mitigation are available, a trip-based threshold should be used, and project VMT should be assessed in a trip-based manner.

When a trip-based method is used to analyze a residential project, the focus can be on home-based trips. Similarly, when a trip-based method is used to analyze an office project, the focus can be on home-based work trips.

When tour-based models are used to analyze an office project, either employee work tour VMT or VMT from all employee tours may be attributed to the project. This is because workplace location influences overall travel. For consistency, the significance threshold should be based on the same metric: either employee work tour VMT or VMT from all employee tours.

For office projects that feature a customer component, such as a government office that serves the public, a lead agency can analyze the customer VMT component of the project using the methodology for retail development (see below).

Retail Projects. Generally, lead agencies should analyze the effects of a retail project by assessing the change in total VMT[11] because retail projects typically re-route travel from other retail destinations. A retail project might lead to increases or decreases in VMT, depending on previously existing retail travel patterns.

[10] See Appendix 1, *Considerations About Which VMT to Count,* for a description of these approaches.
[11] See Appendix 1, *Considerations About Which VMT to Count, "*Assessing Change in Total VMT" section, for a description of this approach.

Considerations for All Projects. Lead agencies should not truncate any VMT analysis because of jurisdictional or other boundaries, for example, by failing to count the portion of a trip that falls outside the jurisdiction or by discounting the VMT from a trip that crosses a jurisdictional boundary. CEQA requires environmental analyses to reflect a "good faith effort at full disclosure." (CEQA Guidelines, § 15151.) Thus, where methodologies exist that can estimate the full extent of vehicle travel from a project, the lead agency should apply them to do so. Where those VMT effects will grow over time, analyses should consider both a project's short-term and long-term effects on VMT.

Combining land uses for VMT analysis is not recommended. Different land uses generate different amounts of VMT, so the outcome of such an analysis could depend more on the mix of uses than on their travel efficiency. As a result, it could be difficult or impossible for a lead agency to connect a significance threshold with an environmental policy objective (such as a target set by law), inhibiting the CEQA imperative of identifying a project's significant impacts and providing mitigation where feasible. Combining land uses for a VMT analysis could streamline certain mixes of uses in a manner disconnected from policy objectives or environmental outcomes. Instead, OPR recommends analyzing each use separately, or simply focusing analysis on the dominant use, and comparing each result to the appropriate threshold. Recommendations for methods of analysis and thresholds are provided below. In the analysis of each use, a mixed-use project should take credit for internal capture.

Any project that includes in its geographic bounds a portion of an existing or planned Transit Priority Area (i.e., the project is within a ½ mile of an existing or planned major transit stop or an existing stop along a high quality transit corridor) may employ VMT as its primary metric of transportation impact for the entire project. (See Pub. Resources Code, § 21099, subds. (a)(7), (b)(1).)

Cumulative Impacts. A project's cumulative impacts are based on an assessment of whether the "incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." (Pub. Resources Code, § 21083, subd. (b)(2); see CEQA Guidelines, § 15064, subd. (h)(1).) When using an absolute VMT metric, i.e., total VMT (as recommended below for retail and transportation projects), analyzing the combined impacts for a cumulative impacts analysis may be appropriate. However, metrics such as VMT per capita or VMT per employee, i.e., metrics framed in terms of efficiency (as recommended below for use on residential and office projects), cannot be summed because they employ a denominator. A project that falls below an efficiency-based threshold that is aligned with long-term environmental goals and relevant plans would have no cumulative impact distinct from the project impact. Accordingly, a finding of a less-than-significant project impact would imply a less than significant cumulative impact, and vice versa. This is similar to the analysis typically conducted for greenhouse gas emissions, air quality impacts, and impacts that utilize plan compliance as a threshold of significance. (See *Center for Biological Diversity v. Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 219, 223; CEQA Guidelines, § 15064, subd. (h)(3).)

D. General Principles to Guide Consideration of VMT

SB 743 directs OPR to establish specific "criteria for determining the significance of transportation impacts of projects[.]" (Pub. Resources Code, § 21099, subd. (b)(1).) In establishing this criterion, OPR was guided by the general principles contained within CEQA, the CEQA Guidelines, and applicable case law.

To assist in the determination of significance, many lead agencies rely on "thresholds of significance." The CEQA Guidelines define a "threshold of significance" to mean "an identifiable **quantitative, qualitative[12] or performance level** of a particular environmental effect, non-compliance with which means the effect will ***normally*** be determined to be significant by the agency and compliance with which means the effect ***normally*** will be determined to be less than significant." (CEQA Guidelines, § 15064.7, subd. (a) (emphasis added).) Lead agencies have discretion to develop and adopt their own, or rely on thresholds recommended by other agencies, "provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence." (*Id*. at subd. (c); *Save Cuyama Valley v. County of Santa Barbara* (2013) 213 Cal.App.4th 1059, 1068.) Substantial evidence means "enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached." (*Id*. at § 15384 (emphasis added); *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1108-1109.)

Additionally, the analysis leading to the determination of significance need not be perfect. The CEQA Guidelines describe the standard for adequacy of environmental analyses:

> An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to **make a decision which intelligently takes account of environmental consequences**. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is **reasonably feasible**. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The **courts have looked not for perfection** but for **adequacy**, **completeness**, and a **good faith effort** at full disclosure.

(CEQA Guidelines, § 15151 (emphasis added).)

These general principles guide OPR's recommendations regarding thresholds of significance for VMT set forth below.

[12] Generally, qualitative analyses should only be conducted when methods do not exist for undertaking a quantitative analysis.

E. Recommendations Regarding Significance Thresholds

As noted above, lead agencies have the discretion to set or apply their own thresholds of significance. (*Center for Biological Diversity v. California Dept. of Fish & Wildlife* (2015) 62 Cal.4th 204, 218-223 [lead agency had discretion to use compliance with AB 32's emissions goals as a significance threshold]; *Save Cuyama Valley v. County of Santa Barbara* (2013) 213 Cal.App.4th at p. 1068.) However, Section 21099 of the Public Resources Code states that the criteria for determining the significance of transportation impacts must promote: (1) reduction of greenhouse gas emissions; (2) development of multimodal transportation networks; and (3) a diversity of land uses. It further directed OPR to prepare and develop criteria for determining significance. (Pub. Resources Code, § 21099, subd. (b)(1).) This section provides OPR's suggested thresholds, as well as considerations for lead agencies that choose to adopt their own thresholds.

The VMT metric can support the three statutory goals: "the reduction of greenhouse gas emissions, the development of multimodal transportation networks, ***and*** a diversity of land uses." (Pub. Resources Code, § 21099, subd. (b)(1), emphasis added.) However, in order for it to promote and support all three, lead agencies should select a significance threshold that aligns with state law on all three. State law concerning the development of multimodal transportation networks and diversity of land uses requires planning for and prioritizing increases in complete streets and infill development, but does not mandate a particular depth of implementation that could translate into a particular threshold of significance. Meanwhile, the State has clear quantitative targets for GHG emissions reduction set forth in law and based on scientific consensus, and the depth of VMT reduction needed to achieve those targets has been quantified. Tying VMT thresholds to GHG reduction also supports the two other statutory goals. Therefore, to ensure adequate analysis of transportation impacts, OPR recommends using quantitative VMT thresholds linked to GHG reduction targets when methods exist to do so.

Various legislative mandates and state policies establish quantitative greenhouse gas emissions reduction targets. For example:

- Assembly Bill 32 (2006) requires statewide GHG emissions reductions to 1990 levels by 2020 and continued reductions beyond 2020.

- Senate Bill 32 (2016) requires at least a 40 percent reduction in GHG emissions from 1990 levels by 2030.

- Pursuant to Senate Bill 375 (2008), the California Air Resources Board GHG emissions reduction targets for metropolitan planning organizations (MPOs) to achieve based on land use patterns and transportation systems specified in Regional Transportation Plans and Sustainable Community Strategies (RTP/SCS). Current targets for the State's largest MPOs call for a 19 percent reduction in GHG emissions from cars and light trucks from 2005 emissions levels by 2035.

- Executive Order B-30-15 (2015) sets a GHG emissions reduction target of 40 percent below 1990 levels by 2030.

- Executive Order S-3-05 (2005) sets a GHG emissions reduction target of 80 percent below 1990 levels by 2050.

- Executive Order B-16-12 (2012) specifies a GHG emissions reduction target of 80 percent below 1990 levels by 2050 specifically for transportation.

- Executive Order B-55-18 (2018) established an additional statewide goal of achieving carbon neutrality as soon as possible, but no later than 2045, and maintaining net negative emissions thereafter. It states, "The California Air Resources Board shall work with relevant state agencies to develop a framework for implementation and accounting that tracks progress toward this goal."

- Senate Bill 391 requires the California Transportation Plan to support 80 percent reduction in GHGs below 1990 levels by 2050.

- The *California Air Resources Board Mobile Source Strategy* (2016) describes California's strategy for containing air pollutant emissions from vehicles, and quantifies VMT growth compatible with achieving state targets.

- The California Air Resources Board's *2017 Climate Change Scoping Plan Update: The Strategy for Achieving California's 2030 Greenhouse Gas Target* describes California's strategy for containing GHG emissions from vehicles, and quantifies VMT growth compatible with achieving state targets.

Considering these various targets, the California Supreme Court observed:

> Meeting our statewide reduction goals does not preclude all new development. Rather, the Scoping Plan … assumes continued growth and depends on increased efficiency and conservation in land use and transportation from all Californians.

(*Center for Biological Diversity v. California Dept. of Fish & Wildlife*, *supra*, 62 Cal.4th at p. 220.) Indeed, the Court noted that when a lead agency uses consistency with climate goals as a way to determine significance, particularly for long-term projects, the lead agency must consider the project's effect on meeting long-term reduction goals. (*Ibid*.) And more recently, the Supreme Court stated that "CEQA requires public agencies . . . to ensure that such analysis stay in step with evolving scientific knowledge and state regulatory schemes." (*Cleveland National Forest Foundation v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497, 504.)

Meeting the targets described above will require substantial reductions in existing VMT per capita to curb GHG emissions and other pollutants. But targets for overall GHG emissions reduction do not translate directly into VMT thresholds for individual projects for many reasons, including:

- Some, but not all, of the emissions reductions needed to achieve those targets could be accomplished by other measures, including increased vehicle efficiency and decreased fuel carbon content. The CARB's *First Update to the Climate Change Scoping Plan* explains:

"Achieving California's long-term criteria pollutant and GHG emissions goals will require four strategies to be employed: (1) improve vehicle efficiency and develop zero emission technologies, (2) reduce the carbon content of fuels and provide market support to get these lower-carbon fuels into the marketplace, (3) **plan and build communities to reduce vehicular GHG emissions and provide more transportation options, and (4) improve the efficiency and throughput of existing transportation systems.**"[13] CARB's *2018 Progress Report on California's Sustainable Communities and Climate Protection Act* states on page 28 that "California cannot meet its climate goals without curbing growth in single-occupancy vehicle activity." In other words, vehicle efficiency and better fuels are necessary, but insufficient, to address the GHG emissions from the transportation system. Land use patterns and transportation options also will need to change to support reductions in vehicle travel/VMT.

- New land use projects alone will not sufficiently reduce per-capita VMT to achieve those targets, nor are they expected to be the sole source of VMT reduction.

- Interactions between land use projects, and also between land use and transportation projects, existing and future, together affect VMT.

- Because location within the region is the most important determinant of VMT, in some cases, streamlining CEQA review of projects in travel efficient locations may be the most effective means of reducing VMT.

- When assessing climate impacts of some types of land use projects, use of an efficiency metric (e.g., per capita, per employee) may provide a better measure of impact than an absolute numeric threshold. (*Center for Biological Diversity*, *supra*.)

Public Resources Code section 21099 directs OPR to propose criteria for determining the significance of transportation impacts. In this Technical Advisory, OPR provides its recommendations to assist lead agencies in selecting a significance threshold that may be appropriate for their particular projects. While OPR's Technical Advisory is not binding on public agencies, CEQA allows lead agencies to "consider thresholds of significance . . . recommended by other public agencies, provided the decision to adopt those thresholds is supported by substantial evidence." (CEQA Guidelines, § 15064.7, subd. (c).) Based on OPR's extensive review of the applicable research, and in light of an assessment by the California Air Resources Board quantifying the need for VMT reduction in order to meet the State's long-term climate goals, **OPR recommends that a per capita or per employee VMT that is fifteen percent below that of existing development may be a reasonable threshold**.

Fifteen percent reductions in VMT are achievable at the project level in a variety of place types.[14]

Moreover, a fifteen percent reduction is consistent with SB 743's direction to OPR to select a threshold that will help the State achieve its climate goals. As described above, section 21099 states that the

[13] California Air Resources Board (May 2014) *First Update to the Climate Change Scoping Plan*, p. 46 (emphasis added).
[14] CAPCOA (2010) *Quantifying Greenhouse Gas Mitigation Measures*, p. 55, available at http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

criteria for determining significance must "promote the reduction in greenhouse gas emissions." In its document *California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*[15], CARB assesses VMT reduction per capita consistent with its evidence-based modeling scenario that would achieve State climate goals of 40 percent GHG emissions reduction from 1990 levels by 2030 and 80 percent GHG emissions reduction levels from 1990 by 2050. Applying California Department of Finance population forecasts, CARB finds per-capita light-duty vehicle travel would need to be approximately 16.8 percent lower than existing, and overall per-capita vehicle travel would need to be approximately 14.3 percent lower than existing levels under that scenario. Below these levels, a project could be considered low VMT and would, on that metric, be consistent with 2017 Scoping Plan Update assumptions that achieve climate state climate goals.

CARB finds per capita vehicle travel would need to be kept below what today's policies and plans would achieve.

CARB's assessment is based on data in the 2017 Scoping Plan Update and 2016 Mobile Source Strategy. In those documents, CARB previously examined the relationship between VMT and the state's GHG emissions reduction targets. The Scoping Plan finds:

> "While the State can do more to accelerate and incentivize these local decisions, local actions that reduce VMT are also necessary to meet transportation sector-specific goals and achieve the 2030 target under SB 32. Through developing the Scoping Plan, CARB staff is more convinced than ever that, in addition to achieving GHG reductions from cleaner fuels and vehicles, California must also reduce VMT. Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward needed reductions, but alone will not provide the VMT growth reductions needed; there is a gap between what SB 375 can provide and what is needed to meet the State's 2030 and 2050 goals."[16]

Note that, at present, consistency with RTP/SCSs does not necessarily lead to a less-than-significant VMT impact.[17] As the Final 2017 Scoping Plan Update states,

> VMT reductions are necessary to achieve the 2030 target and must be part of any strategy evaluated in this Plan. Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward this goal, but alone will not provide all of the VMT growth reductions that will be needed. There is a gap between what SB 375 can provide and what is needed to meet the State's 2030 and 2050 goals."[18]

[15] California Air Resources Board (Jan. 2019) *California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*, available at https://ww2.arb.ca.gov/resources/documents/carb-2017-scoping-plan-identified-vmt-reductions-and-relationship-state-climate.
[16] California Air Resources Board (Nov. 2017) *California's 2017 Climate Change Scoping Plan*, p. 101.
[17] California Air Resources Board (Feb. 2018) *Updated Final Staff Report: Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets*, Figure 3, p. 35, available at https://www.arb.ca.gov/cc/sb375/sb375_target_update_final_staff_report_feb2018.pdf.
[18] California Air Resources Board (Nov. 2017) *California's 2017 Climate Change Scoping Plan*, p. 75.

Also, in order to capture the full effects of induced travel resulting from roadway capacity projects, an RTP/SCS would need to include an assessment of land use effects of those projects, and the effects of those land uses on VMT. (See section titled "*Estimating VMT Impacts from Transportation Projects"* below.) RTP/SCSs typically model VMT using a collaboratively-developed land use "vision" for the region's land use, rather than studying the effects on land use of the proposed transportation investments.

In summary, achieving 15 percent lower per capita (residential) or per employee (office) VMT than existing development is both generally achievable and is supported by evidence that connects this level of reduction to the State's emissions goals.

1. Screening Thresholds for Land Use Projects

Many agencies use "screening thresholds" to quickly identify when a project should be expected to cause a less-than-significant impact without conducting a detailed study. (See e.g., CEQA Guidelines, §§ 15063(c)(3)(C), 15128, and Appendix G.) As explained below, this technical advisory suggests that lead agencies may screen out VMT impacts using project size, maps, transit availability, and provision of affordable housing.

Screening Threshold for Small Projects

Many local agencies have developed screening thresholds to indicate when detailed analysis is needed. Absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with a Sustainable Communities Strategy (SCS) or general plan, projects that generate or attract fewer than 110 trips per day[19] generally may be assumed to cause a less-than-significant transportation impact.

Map-Based Screening for Residential and Office Projects

Residential and office projects that locate in areas with low VMT, and that incorporate similar features (i.e., density, mix of uses, transit accessibility), will tend to exhibit similarly low VMT. Maps created with VMT data, for example from a travel survey or a travel demand model, can illustrate areas that are

[19] CEQA provides a categorical exemption for existing facilities, including additions to existing structures of up to 10,000 square feet, so long as the project is in an area where public infrastructure is available to allow for maximum planned development and the project is not in an environmentally sensitive area. (CEQA Guidelines, § 15301, subd. (e)(2).) Typical project types for which trip generation increases relatively linearly with building footprint (i.e., general office building, single tenant office building, office park, and business park) generate or attract an additional 110-124 trips per 10,000 square feet. Therefore, absent substantial evidence otherwise, it is reasonable to conclude that the addition of 110 or fewer trips could be considered not to lead to a significant impact.

currently below threshold VMT (see recommendations below). Because new development in such locations would likely result in a similar level of VMT, such maps can be used to screen out residential and office projects from needing to prepare a detailed VMT analysis.

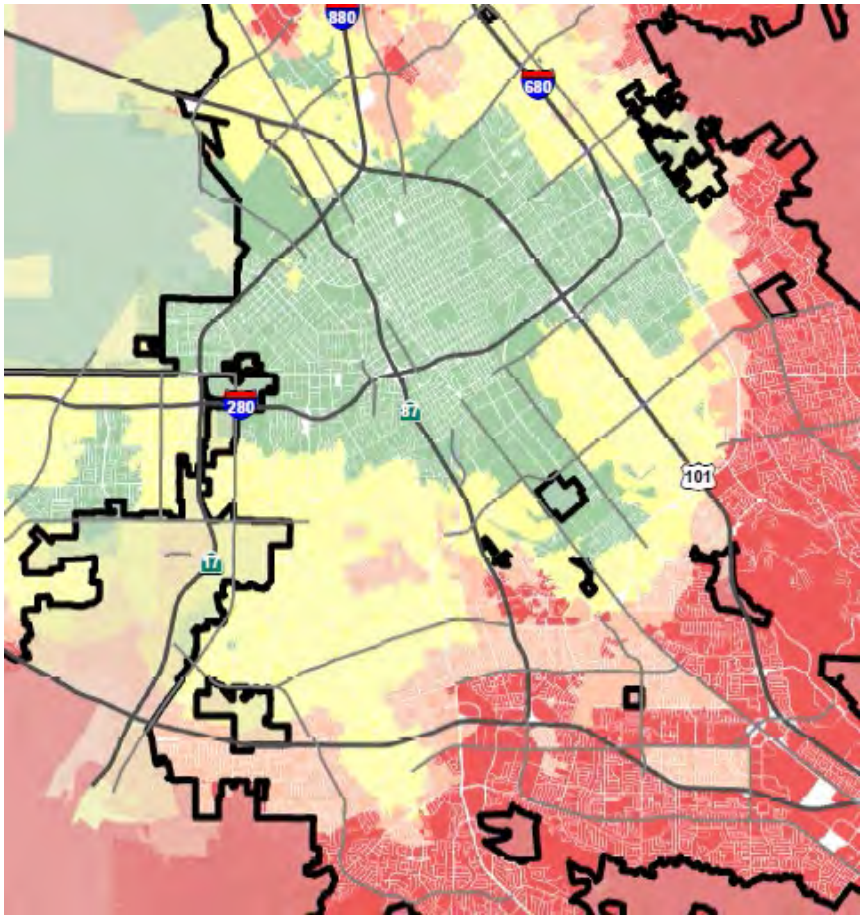

Figure 2. Example map of household VMT that could be used to delineate areas eligible to receive streamlining for VMT analysis. (Source: City of San José, Department of Transportation, draft output of City Transportation Model.)

Presumption of Less Than Significant Impact Near Transit Stations

Proposed CEQA Guideline Section 15064.3, subdivision (b)(1), states that lead agencies generally should presume that certain projects (including residential, retail, and office projects, as well as projects that are a mix of these uses) proposed within ½ mile of an existing major transit stop[20] or an existing stop

[20] Pub. Resources Code, § 21064.3 ("'Major transit stop' means a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods.").

along a high quality transit corridor[21] will have a less-than-significant impact on VMT. This presumption would not apply, however, if project-specific or location-specific information indicates that the project will still generate significant levels of VMT. For example, the presumption might not be appropriate if the project:

- Has a Floor Area Ratio (FAR) of less than 0.75
- Includes more parking for use by residents, customers, or employees of the project than required by the jurisdiction (if the jurisdiction requires the project to supply parking)
- Is inconsistent with the applicable Sustainable Communities Strategy (as determined by the lead agency, with input from the Metropolitan Planning Organization)
- Replaces affordable residential units with a smaller number of moderate- or high-income residential units

A project or plan near transit which replaces affordable residential units[22] with a smaller number of moderate- or high-income residential units may increase overall VMT because the increase in VMT of displaced residents could overwhelm the improvements in travel efficiency enjoyed by new residents.[23]

If any of these exceptions to the presumption might apply, the lead agency should conduct a detailed VMT analysis to determine whether the project would exceed VMT thresholds (see below).

Presumption of Less Than Significant Impact for Affordable Residential Development

Adding affordable housing to infill locations generally improves jobs-housing match, in turn shortening commutes and reducing VMT.[24,25] Further, "… low-wage workers in particular would be more likely to choose a residential location close to their workplace, if one is available."[26] In areas where existing jobs-housing match is closer to optimal, low income housing nevertheless generates less VMT than market-

[21] Pub. Resources Code, § 21155 ("For purposes of this section, a high-quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.").
[22] Including naturally-occurring affordable residential units.
[23] Chapple et al. (2017) *Developing a New Methodology for Analyzing Potential Displacement,* Chapter 4, pp. 159-160, available at https://www.arb.ca.gov/research/apr/past/13-310.pdf.
[24] Karner and Benner (2016) *The convergence of social equity and environmental sustainability: Jobs-housing fit and commute distance* ("[P]olicies that advance a more equitable distribution of jobs and housing by linking the affordability of locally available housing with local wage levels are likely to be associated with reduced commuting distances").
[25] Karner and Benner (2015) *Low-wage jobs-housing fit: identifying locations of affordable housing shortages.*
[26] Karner and Benner (2015) *Low-wage jobs-housing fit: identifying locations of affordable housing shortages.*

rate housing.[27,28] Therefore, a project consisting of a high percentage of affordable housing may be a basis for the lead agency to find a less-than-significant impact on VMT. Evidence supports a presumption of less than significant impact for a 100 percent affordable residential development (or the residential component of a mixed-use development) in infill locations. Lead agencies may develop their own presumption of less than significant impact for residential projects (or residential portions of mixed use projects) containing a particular amount of affordable housing, based on local circumstances and evidence. Furthermore, a project which includes any affordable residential units may factor the effect of the affordability on VMT into the assessment of VMT generated by those units.

2. Recommended Numeric Thresholds for Residential, Office, and Retail Projects

Recommended threshold for residential projects: A proposed project exceeding a level of 15 percent below existing VMT per capita may indicate a significant transportation impact. Existing VMT per capita may be measured as regional VMT per capita or as city VMT per capita. Proposed development referencing a threshold based on city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the number of units specified in the SCS for that city, and should be consistent with the SCS.

Residential development that would generate vehicle travel that is 15 or more percent below the existing residential VMT per capita, measured against the region or city, may indicate a less-than-significant transportation impact. In MPO areas, development measured against city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the population or number of units specified in the SCS for that city because greater-than-planned amounts of development in areas above the region-based threshold would undermine the VMT containment needed to achieve regional targets under SB 375.

For residential projects in unincorporated county areas, the local agency can compare a residential project's VMT to (1) the region's VMT per capita, or (2) the aggregate population-weighted VMT per capita of all cities in the region. In MPO areas, development in unincorporated areas measured against aggregate city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the population or number of units specified in the SCS for that city because greater-than-planned amounts of development in areas above the regional threshold would undermine achievement of regional targets under SB 375.

[27] Chapple et al. (2017) *Developing a New Methodology for Analyzing Potential Displacement*, available at https://www.arb.ca.gov/research/apr/past/13-310.pdf.
[28] CAPCOA (2010) *Quantifying Greenhouse Gas Mitigation Measures*, pp. 176-178, available at http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

These thresholds can be applied to either household (i.e., tour-based) VMT or home-based (i.e., trip-based) VMT assessments.[29] It is critical, however, that the agency be consistent in its VMT measurement approach throughout the analysis to maintain an "apples-to-apples" comparison. For example, if the agency uses a home-based VMT for the threshold, it should also be use home-based VMT for calculating project VMT and VMT reduction due to mitigation measures.

Recommended threshold for office projects: A proposed project exceeding a level of 15 percent below existing regional VMT per employee may indicate a significant transportation impact.

Office projects that would generate vehicle travel exceeding 15 percent below existing VMT per employee for the region may indicate a significant transportation impact. In cases where the region is substantially larger than the geography over which most workers would be expected to live, it might be appropriate to refer to a smaller geography, such as the county, that includes the area over which nearly all workers would be expected to live.

Office VMT screening maps can be developed using tour-based data, considering either total employee VMT or employee work tour VMT. Similarly, tour-based analysis of office project VMT could consider either total employee VMT or employee work tour VMT. Where tour-based information is unavailable for threshold determination, project assessment, or assessment of mitigation, home-based work trip VMT should be used throughout all steps of the analysis to maintain an "apples-to-apples" comparison.

Recommended threshold for retail projects: A net increase in total VMT may indicate a significant transportation impact.

Because new retail development typically redistributes shopping trips rather than creating new trips,[30] estimating the total change in VMT (i.e., the difference in total VMT in the area affected with and without the project) is the best way to analyze a retail project's transportation impacts.

By adding retail opportunities into the urban fabric and thereby improving retail destination proximity, local-serving retail development tends to shorten trips and reduce VMT. Thus, lead agencies generally may presume such development creates a less-than-significant transportation impact. Regional-serving retail development, on the other hand, which can lead to substitution of longer trips for shorter ones, may tend to have a significant impact. Where such development decreases VMT, lead agencies should consider the impact to be less-than-significant.

Many cities and counties define local-serving and regional-serving retail in their zoning codes. Lead agencies may refer to those local definitions when available, but should also consider any project-

[29] See Appendix 1 for a description of these approaches.
[30] Lovejoy, et al. (2013) *Measuring the impacts of local land-use policies on vehicle miles of travel: The case of the first big-box store in Davis, California, The Journal of Transport and Land Use*.

specific information, such as market studies or economic impacts analyses that might bear on customers' travel behavior. Because lead agencies will best understand their own communities and the likely travel behaviors of future project users, they are likely in the best position to decide when a project will likely be local-serving. Generally, however, retail development including stores larger than 50,000 square feet might be considered regional-serving, and so lead agencies should undertake an analysis to determine whether the project might increase or decrease VMT.

Mixed-Use Projects

Lead agencies can evaluate each component of a mixed-use project independently and apply the significance threshold for each project type included (e.g., residential and retail). Alternatively, a lead agency may consider only the project's dominant use. In the analysis of each use, a project should take credit for internal capture. Combining different land uses and applying one threshold to those land uses may result in an inaccurate impact assessment.

Other Project Types

Of land use projects, residential, office, and retail projects tend to have the greatest influence on VMT. For that reason, OPR recommends the quantified thresholds described above for purposes of analysis and mitigation. Lead agencies, using more location-specific information, may develop their own more specific thresholds, which may include other land use types. In developing thresholds for other project types, or thresholds different from those recommended here, lead agencies should consider the purposes described in section 21099 of the Public Resources Code and regulations in the CEQA Guidelines on the development of thresholds of significance (e.g., CEQA Guidelines, § 15064.7).

Strategies and projects that decrease local VMT but increase total VMT should be avoided. Agencies should consider whether their actions encourage development in a less travel-efficient location by limiting development in travel-efficient locations.

Redevelopment Projects

Where a project replaces existing VMT-generating land uses, if the replacement leads to a net overall decrease in VMT, the project would lead to a less-than-significant transportation impact. If the project leads to a net overall increase in VMT, then the thresholds described above should apply.

As described above, a project or plan near transit which replaces affordable[31] residential units with a smaller number of moderate- or high-income residential units may increase overall VMT, because

[31] Including naturally-occurring affordable residential units.

displaced residents' VMT may increase.[32] A lead agency should analyze VMT for such a project even if it otherwise would have been presumed less than significant. The assessment should incorporate an estimate of the aggregate VMT increase experienced by displaced residents. That additional VMT should be included in the numerator of the VMT per capita assessed for the project.

If a residential or office project leads to a net increase in VMT, then the project's VMT per capita (residential) or per employee (office) should be compared to thresholds recommended above. Per capita and per employee VMT are efficiency metrics, and, as such, apply only to the existing project without regard to the VMT generated by the previously existing land use.

If the project leads to a net increase in provision of locally-serving retail, transportation impacts from the retail portion of the development should be presumed to be less than significant. If the project consists of regionally-serving retail, and increases overall VMT compared to with existing uses, then the project would lead to a significant transportation impact.

RTP/SCS Consistency (All Land Use Projects)

Section 15125, subdivision (d), of the CEQA Guidelines provides that lead agencies should analyze impacts resulting from inconsistencies with regional plans, including regional transportation plans. For this reason, if a project is inconsistent with the Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS), the lead agency should evaluate whether that inconsistency indicates a significant impact on transportation. For example, a development may be inconsistent with an RTP/SCS if the development is outside the footprint of development or within an area specified as open space as shown in the SCS.

3. Recommendations Regarding Land Use Plans

As with projects, agencies should analyze VMT outcomes of land use plans across the full area over which the plan may substantively affect travel patterns, including beyond the boundary of the plan or jurisdiction's geography. And as with projects, VMT should be counted in full rather than split between origin and destination. (Emissions inventories have sometimes spit cross-boundary trips in order to sum to a regional total, but CEQA requires accounting for the full impact without truncation or discounting). Analysis of specific plans may employ the same thresholds described above for projects. A general plan, area plan, or community plan may have a significant impact on transportation if proposed new residential, office, or retail land uses would in aggregate exceed the respective thresholds recommended above. Where the lead agency tiers from a general plan EIR pursuant to CEQA Guidelines sections 15152 and 15166, the lead agency generally focuses on the environmental impacts that are specific to the later project and were not analyzed as significant impacts in the prior EIR. (Pub. Resources Code, § 21068.5; Guidelines, § 15152, subd. (a).) Thus, in analyzing the later project, the lead agency

[32] Chapple et al. (2017) *Developing a New Methodology for Analyzing Potential Displacement,* Chapter 4, pp. 159-160, available at https://www.arb.ca.gov/research/apr/past/13-310.pdf.

would focus on the VMT impacts that were not adequately addressed in the prior EIR. In the tiered document, the lead agency should continue to apply the thresholds recommended above.

Thresholds for plans in non-MPO areas may be determined on a case-by-case basis.

4. Other Considerations

Rural Projects Outside of MPOs

In rural areas of non-MPO counties (i.e., areas not near established or incorporated cities or towns), fewer options may be available for reducing VMT, and significance thresholds may be best determined on a case-by-case basis. Note, however, that clustered small towns and small town main streets may have substantial VMT benefits compared to isolated rural development, similar to the transit oriented development described above.

Impacts to Transit

Because criteria for determining the significance of transportation impacts must promote "the development of multimodal transportation networks" pursuant to Public Resources Code section 21099, subd. (b)(1), lead agencies should consider project impacts to transit systems and bicycle and pedestrian networks. For example, a project that blocks access to a transit stop or blocks a transit route itself may interfere with transit functions. Lead agencies should consult with transit agencies as early as possible in the development process, particularly for projects that are located within one half mile of transit stops.

When evaluating impacts to multimodal transportation networks, lead agencies generally should not treat the addition of new transit users as an adverse impact. An infill development may add riders to transit systems and the additional boarding and alighting may slow transit vehicles, but it also adds destinations, improving proximity and accessibility. Such development also improves regional vehicle flow by adding less vehicle travel onto the regional network.

Increased demand throughout a region may, however, cause a cumulative impact by requiring new or additional transit infrastructure. Such impacts may be adequately addressed through a fee program that fairly allocates the cost of improvements not just to projects that happen to locate near transit, but rather across a region to all projects that impose burdens on the entire transportation system, since transit can broadly improve the function of the transportation system.

F. Considering the Effects of Transportation Projects on Vehicle Travel

Many transportation projects change travel patterns. A transportation project which leads to additional vehicle travel on the roadway network, commonly referred to as "induced vehicle travel," would need to quantify the amount of additional vehicle travel in order to assess air quality impacts, greenhouse gas emissions impacts, energy impacts, and noise impacts. Transportation projects also are required to

examine induced growth impacts under CEQA. (See generally, Pub. Resources Code, §§ 21065 [defining "project" under CEQA as an activity as causing either a direct or reasonably foreseeable indirect physical change], 21065.3 [defining "project-specific effect" to mean all direct or indirect environmental effects], 21100, subd. (b) [required contents of an EIR].) For any project that increases vehicle travel, explicit assessment and quantitative reporting of the amount of additional vehicle travel should not be omitted from the document; such information may be useful and necessary for a full understanding of a project's environmental impacts. (See Pub. Resources Code, §§ 21000, 21001, 21001.1, 21002, 21002.1 [discussing the policies of CEQA].) A lead agency that uses the VMT metric to assess the transportation impacts of a transportation project may simply report that change in VMT as the impact. When the lead agency uses another metric to analyze the transportation impacts of a roadway project, changes in amount of vehicle travel added to the roadway network should still be analyzed and reported.[33]

While CEQA does not require perfection, it is important to make a reasonably accurate estimate of transportation projects' effects on vehicle travel in order to make reasonably accurate estimates of GHG emissions, air quality emissions, energy impacts, and noise impacts. (See, e.g., *California Clean Energy Com. v. City of Woodland* (2014) 225 Cal.App.4th 173, 210 [EIR failed to consider project's transportation energy impacts]; *Ukiah Citizens for Safety First v. City of Ukiah* (2016) 248 Cal.App.4th 256, 266.) Appendix 2 describes in detail the causes of induced vehicle travel, the robust empirical evidence of induced vehicle travel, and how models and research can be used in conjunction to quantitatively assess induced vehicle travel with reasonable accuracy.

If a project would likely lead to a measurable and substantial increase in vehicle travel, the lead agency should conduct an analysis assessing the amount of vehicle travel the project will induce. Project types that would likely lead to a measurable and substantial increase in vehicle travel generally include:

- Addition of through lanes on existing or new highways, including general purpose lanes, HOV lanes, peak period lanes, auxiliary lanes, or lanes through grade-separated interchanges

Projects that would not likely lead to a substantial or measurable increase in vehicle travel, and therefore generally should not require an induced travel analysis, include:

- Rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets (e.g., highways; roadways; bridges; culverts; Transportation Management System field elements such as cameras, message signs, detection, or signals; tunnels; transit systems; and assets that serve bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity
- Roadside safety devices or hardware installation such as median barriers and guardrails

[33] See, e.g., California Department of Transportation (2006) *Guidance for Preparers of Growth-related, Indirect Impact Analyses*, available at http://www.dot.ca.gov/ser/Growth-related_IndirectImpactAnalysis/GRI_guidance06May_files/gri_guidance.pdf.

- Roadway shoulder enhancements to provide “breakdown space,” dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes
- Addition of an auxiliary lane of less than one mile in length designed to improve roadway safety
- Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left, right, and U-turn pockets, two-way left turn lanes, or emergency breakdown lanes that are not utilized as through lanes
- Addition of roadway capacity on local or collector streets provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit
- Conversion of existing general purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel
- Addition of a new lane that is permanently restricted to use only by transit vehicles
- Reduction in number of through lanes
- Grade separation to separate vehicles from rail, transit, pedestrians or bicycles, or to replace a lane in order to separate preferential vehicles (e.g., HOV, HOT, or trucks) from general vehicles
- Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features
- Installation of traffic metering systems, detection systems, cameras, changeable message signs and other electronics designed to optimize vehicle, bicycle, or pedestrian flow
- Timing of signals to optimize vehicle, bicycle, or pedestrian flow
- Installation of roundabouts or traffic circles
- Installation or reconfiguration of traffic calming devices
- Adoption of or increase in tolls
- Addition of tolled lanes, where tolls are sufficient to mitigate VMT increase
- Initiation of new transit service
- Conversion of streets from one-way to two-way operation with no net increase in number of traffic lanes
- Removal or relocation of off-street or on-street parking spaces
- Adoption or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)
- Addition of traffic wayfinding signage
- Rehabilitation and maintenance projects that do not add motor vehicle capacity
- Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way
- Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve non-motorized travel
- Installation of publicly available alternative fuel/charging infrastructure
- Addition of passing lanes, truck climbing lanes, or truck brake-check lanes in rural areas that do not increase overall vehicle capacity along the corridor

1. Recommended Significance Threshold for Transportation Projects

As noted in Section 15064.3 of the CEQA Guidelines, lead agencies for roadway capacity projects have discretion, consistent with CEQA and planning requirements, to choose which metric to use to evaluate transportation impacts. This section recommends considerations for evaluating impacts using vehicle miles traveled. Lead agencies have discretion to choose a threshold of significance for transportation projects as they do for other types of projects. As explained above, Public Resources Code section 21099, subdivision (b)(1), provides that criteria for determining the significance of transportation impacts must promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses. (*Id.*; see generally, adopted CEQA Guidelines, § 15064.3, subd. (b) [Criteria for Analyzing Transportation Impacts].) With those goals in mind, OPR prepared and the Agency adopted an appropriate transportation metric.

Whether adopting a threshold of significance, or evaluating transportation impacts on a case-by-case basis, a lead agency should ensure that the analysis addresses:

- Direct, indirect and cumulative effects of the transportation project (CEQA Guidelines, § 15064, subds. (d), (h))
- Near-term and long-term effects of the transportation project (CEQA Guidelines, §§ 15063, subd. (a)(1), 15126.2, subd. (a))
- The transportation project's consistency with state greenhouse gas reduction goals (Pub. Resources Code, § 21099)[34]
- The impact of the transportation project on the development of multimodal transportation networks (Pub. Resources Code, § 21099)
- The impact of the transportation project on the development of a diversity of land uses (Pub. Resources Code, § 21099)

The CARB Scoping Plan and the CARB Mobile Source Strategy delineate VMT levels required to achieve legally mandated GHG emissions reduction targets. A lead agency should develop a project-level threshold based on those VMT levels, and may apply the following approach:

1. Propose a fair-share allocation of those budgets to their jurisdiction (e.g., by population);

[34] The California Air Resources Board has ascertained the limits of VMT growth compatible with California containing greenhouse gas emissions to levels research shows would allow for climate stabilization. (See *The 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Target* (p. 78, p. 101); *Mobile Source Strategy* (p. 37).) CARB's *Updated Final Staff Report on Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets* illustrates that the current Regional Transportation Plans and Sustainable Communities Strategies will fall short of achieving the necessary on-road transportation-related GHG emissions reductions called for in the 2017 Scoping Plan (Figure 3, p. 35). Accordingly, OPR recommends not basing GHG emissions or transportation impact analysis for a transportation project solely on consistency with an RTP/SCS.

2. Determine the amount of VMT growth likely to result from background population growth, and subtract that from their "budget";
3. Allocate their jurisdiction's share between their various VMT-increasing transportation projects, using whatever criteria the lead agency prefers.

2. Estimating VMT Impacts from Transportation Projects

CEQA requires analysis of a project's potential growth-inducing impacts. (Pub. Resources Code, § 21100, subd. (b)(5); CEQA Guidelines, § 15126.2, subd. (d).) Many agencies are familiar with the analysis of growth inducing impacts associated with water, sewer, and other infrastructure. This technical advisory addresses growth that may be expected from roadway expansion projects.

Because a roadway expansion project can induce substantial VMT, incorporating quantitative estimates of induced VMT is critical to calculating both transportation and other impacts of these projects. Induced travel also has the potential to reduce or eliminate congestion relief benefits. An accurate estimate of induced travel is needed to accurately weigh costs and benefits of a highway capacity expansion project.

The effect of a transportation project on vehicle travel should be estimated using the "change in total VMT" method described in *Appendix 1*. This means that an assessment of total VMT without the project and an assessment with the project should be made; the difference between the two is the amount of VMT attributable to the project. The assessment should cover the full area in which driving patterns are expected to change. As with other types of projects, the VMT estimation should not be truncated at a modeling or jurisdictional boundary for convenience of analysis when travel behavior is substantially affected beyond that boundary.

Transit and Active Transportation Projects

Transit and active transportation projects generally reduce VMT and therefore are presumed to cause a less-than-significant impact on transportation. This presumption may apply to all passenger rail projects, bus and bus rapid transit projects, and bicycle and pedestrian infrastructure projects. Streamlining transit and active transportation projects aligns with each of the three statutory goals contained in SB 743 by reducing GHG emissions, increasing multimodal transportation networks, and facilitating mixed use development.

Roadway Projects

Reducing roadway capacity (for example, by removing or repurposing motor vehicle travel lanes) will generally reduce VMT and therefore is presumed to cause a less-than-significant impact on transportation. Generally, no transportation analysis is needed for such projects.

Building new roadways, adding roadway capacity in congested areas, or adding roadway capacity to areas where congestion is expected in the future, typically induces additional vehicle travel. For the types of projects previously indicated as likely to lead to additional vehicle travel, an estimate should be made of the change in vehicle travel resulting from the project.

For projects that increase roadway capacity, lead agencies can evaluate induced travel quantitatively by applying the results of existing studies that examine the magnitude of the increase of VMT resulting from a given increase in lane miles. These studies estimate the percent change in VMT for every percent change in miles to the roadway system (i.e., "elasticity").[35] Given that lead agencies have discretion in choosing their methodology, and the studies on induced travel reveal a range of elasticities, lead agencies may appropriately apply professional judgment in studying the transportation effects of a particular project. The most recent major study, estimates an elasticity of 1.0, meaning that every percent change in lane miles results in a one percent increase in VMT.[36]

To estimate VMT impacts from roadway expansion projects:

1. Determine the total lane-miles over an area that fully captures travel behavior changes resulting from the project (generally the region, but for projects affecting interregional travel look at all affected regions).
2. Determine the percent change in total lane miles that will result from the project.
3. Determine the total existing VMT over that same area.
4. Multiply the percent increase in lane miles by the existing VMT, and then multiply that by the elasticity from the induced travel literature:

[% increase in lane miles] x [existing VMT] x [elasticity] = [VMT resulting from the project]

A National Center for Sustainable Transportation tool can be used to apply this method: https://ncst.ucdavis.edu/research/tools

This method would not be suitable for rural (non-MPO) locations in the state which are neither congested nor projected to become congested. It also may not be suitable for a new road that provides new connectivity across a barrier (e.g., a bridge across a river) if it would be expected to substantially

[35] See U.C. Davis, Institute for Transportation Studies (Oct. 2015) *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*; Boarnet and Handy (Sept. 2014) *Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions*, California Air Resources Board Policy Brief, available at https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf.
[36] See Duranton and Turner (2011) *The Fundamental Law of Road Congestion: Evidence from US cities*, available at http://www.nber.org/papers/w15376.

shorten existing trips. If it is likely to be substantial, the trips-shortening effect should be examined explicitly.

The effects of roadway capacity on vehicle travel can also be applied at a programmatic level. For example, in a regional planning process the lead agency can use that program-level analysis to streamline later project-level analysis. (See CEQA Guidelines, § 15168.) A program-level analysis of VMT should include effects of the program on land use patterns, and the VMT that results from those land use effects. In order for a program-level document to adequately analyze potential induced demand from a project or program of roadway capacity expansion, lead agencies cannot assume a fixed land use pattern (i.e., a land use pattern that does not vary in response to the provision of roadway capacity). A proper analysis should account for land use investment and development pattern changes that react in a reasonable manner to changes in accessibility created by transportation infrastructure investments (whether at the project or program level).

Mitigation and Alternatives

Induced VMT has the potential to reduce or eliminate congestion relief benefits, increase VMT, and increase other environmental impacts that result from vehicle travel.[37] If those effects are significant, the lead agency will need to consider mitigation or alternatives. In the context of increased travel that is induced by capacity increases, appropriate mitigation and alternatives that a lead agency might consider include the following:

- Tolling new lanes to encourage carpools and fund transit improvements
- Converting existing general purpose lanes to HOV or HOT lanes
- Implementing or funding off-site travel demand management
- Implementing Intelligent Transportation Systems (ITS) strategies to improve passenger throughput on existing lanes

Tolling and other management strategies can have the additional benefit of preventing congestion and maintaining free-flow conditions, conferring substantial benefits to road users as discussed above.

G. Analyzing Other Impacts Related to Transportation

While requiring a change in the methodology of assessing transportation impacts, Public Resources Code section 21099 notes that this change "does not relieve a public agency of the requirement to analyze a project's potentially significant transportation impacts related to air quality, noise, safety, or any other impact associated with transportation." OPR expects that lead agencies will continue to

[37] See National Center for Sustainable Transportation (Oct. 2015) *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*, available at http://www.dot.ca.gov/newtech/researchreports/reports/2015/10-12-2015-NCST_Brief_InducedTravel_CS6_v3.pdf; see Duranton and Turner (2011) *The Fundamental Law of Road Congestion: Evidence from US cities*, available at http://www.nber.org/papers/w15376.

address mobile source emissions in the air quality and noise sections of an environmental document and the corresponding studies that support the analysis in those sections. Lead agencies should continue to address environmental impacts of a proposed project pursuant to CEQA's requirements, using a format that is appropriate for their particular project.

Because safety concerns result from many different factors, they are best addressed at a programmatic level (i.e., in a general plan or regional transportation plan) in cooperation with local governments, metropolitan planning organizations, and, where the state highway system is involved, the California Department of Transportation. In most cases, such an analysis would not be appropriate on a project-by-project basis. Increases in traffic volumes at a particular location resulting from a project typically cannot be estimated with sufficient accuracy or precision to provide useful information for an analysis of safety concerns. Moreover, an array of factors affect travel demand (e.g., strength of the local economy, price of gasoline), causing substantial additional uncertainty. Appendix B of OPR's General Plan Guidelines summarizes research which could be used to guide a programmatic analysis under CEQA. Lead agencies should note that automobile congestion or delay does not constitute a significant environmental impact (Pub. Resources Code, §21099(b)(2)), and safety should not be used as a proxy for road capacity.

H. VMT Mitigation and Alternatives

When a lead agency identifies a significant impact, it must identify feasible mitigation measures that could avoid or substantially reduce that impact. (Pub. Resources Code, § 21002.1, subd. (a).) Additionally, CEQA requires that an environmental impact report identify feasible alternatives that could avoid or substantially reduce a project's significant environmental impacts.

Indeed, the California Court of Appeal recently held that a long-term regional transportation plan was deficient for failing to discuss an alternative which could significantly reduce total vehicle miles traveled. In *Cleveland National Forest Foundation v. San Diego Association of Governments, et al.* (2017) 17 Cal.App.5th 413, the court found that omission "inexplicable" given the lead agency's "acknowledgment in its Climate Action Strategy that the state's efforts to reduce greenhouse gas emissions from on-road transportation will not succeed if the amount of driving, or vehicle miles traveled, is not significantly reduced." (*Cleveland National Forest Foundation*, *supra*, 17 Cal.App.5th at p. 436.) Additionally, the court noted that the project alternatives focused primarily on congestion relief even though "the [regional] transportation plan is a long-term and congestion relief is not necessarily an effective long-term strategy." (*Id.* at p. 437.) The court concluded its discussion of the alternatives analysis by stating: "Given the acknowledged long-term drawbacks of congestion relief alternatives, there is not substantial evidence to support the EIR's exclusion of an alternative focused primarily on significantly reducing vehicle trips." (*Ibid*.)

Several examples of potential mitigation measures and alternatives to reduce VMT are described below. However, the selection of particular mitigation measures and alternatives are left to the discretion of

the lead agency, and mitigation measures may vary, depending on the proposed project and significant impacts, if any. Further, OPR expects that agencies will continue to innovate and find new ways to reduce vehicular travel.

Potential measures to reduce vehicle miles traveled include, but are not limited to:

- Improve or increase access to transit.
- Increase access to common goods and services, such as groceries, schools, and daycare.
- Incorporate affordable housing into the project.
- Incorporate neighborhood electric vehicle network.
- Orient the project toward transit, bicycle and pedestrian facilities.
- Improve pedestrian or bicycle networks, or transit service.
- Provide traffic calming.
- Provide bicycle parking.
- Limit or eliminate parking supply.
- Unbundle parking costs.
- Provide parking cash-out programs.
- Implement roadway pricing.
- Implement or provide access to a commute reduction program.
- Provide car-sharing, bike sharing, and ride-sharing programs.
- Provide transit passes.
- Shifting single occupancy vehicle trips to carpooling or vanpooling, for example providing ride-matching services.
- Providing telework options.
- Providing incentives or subsidies that increase the use of modes other than single-occupancy vehicle.
- Providing on-site amenities at places of work, such as priority parking for carpools and vanpools, secure bike parking, and showers and locker rooms.
- Providing employee transportation coordinators at employment sites.
- Providing a guaranteed ride home service to users of non-auto modes.

Notably, because VMT is largely a regional impact, regional VMT-reduction programs may be an appropriate form of mitigation. In lieu fees have been found to be valid mitigation where there is both a commitment to pay fees and evidence that mitigation will actually occur. (*Save Our Peninsula Committee v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 140-141; *Gentry v. City of Murrieta* (1995) 36 Cal.App.4th 1359; *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 727–728.) Fee programs are particularly useful to address cumulative impacts. (CEQA Guidelines, § 15130, subd. (a)(3) [a "project's incremental contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact"].) The mitigation program must undergo CEQA evaluation, either on the program as a whole, or the in-lieu fees or other mitigation must be evaluated

on a project-specific basis. (*California Native Plant Society v. County of El Dorado* (2009) 170 Cal.App.4th 1026.) That CEQA evaluation could be part of a larger program, such as a regional transportation plan, analyzed in a Program EIR. (CEQA Guidelines, § 15168.)

Examples of project alternatives that may reduce vehicle miles traveled include, but are not limited to:

- Locate the project in an area of the region that already exhibits low VMT.
- Locate the project near transit.
- Increase project density.
- Increase the mix of uses within the project or within the project's surroundings.
- Increase connectivity and/or intersection density on the project site.
- Deploy management strategies (e.g., pricing, vehicle occupancy requirements) on roadways or roadway lanes.

Appendix 1. Considerations About Which VMT to Count

Consistent with the obligation to make a good faith effort to disclose the environmental consequences of a project, lead agencies have discretion to choose the most appropriate methodology to evaluate project impacts.[38] A lead agency can evaluate a project's effect on VMT in numerous ways. The purpose of this document is to provide technical considerations in determining which methodology may be most useful for various project types.

Background on Estimating Vehicle Miles Traveled

Before discussing specific methodological recommendations, this section provides a brief overview of modeling and counting VMT, including some key terminology.

Here is an illustrative example of some methods of estimating vehicle miles traveled. Consider the following hypothetical travel day (all by automobile):

1. Residence to Coffee Shop
2. Coffee Shop to Work
3. Work to Sandwich Shop
4. Sandwich Shop to Work
5. Work to Residence
6. Residence to Store
7. Store to Residence

Trip-based assessment of a project's effect on travel behavior counts VMT from individual trips to and from the project. It is the most basic, and traditionally the most common, method of counting VMT. A trip-based VMT assessment of the residence in the above example would consider segments 1, 5, 6 and 7. For residential projects, the sum of home-based trips is called *home-based* VMT.

A *tour-based* assessment counts the entire home-back-to-home tour that includes the project. A tour-based VMT assessment of the residence in the above example would consider segments 1, 2, 3, 4, and 5 in one tour, and 6 and 7 in a second tour. A tour-based assessment of the workplace would include segments 1, 2, 3, 4, and 5. Together, all tours comprise *household* VMT.

[38] The California Supreme Court has explained that when an agency has prepared an environmental impact report:

> [T]he issue is not whether the [lead agency's] studies are irrefutable or whether they could have been better. The relevant issue is only whether the studies are sufficiently credible to be considered as part of the total evidence that supports the [lead agency's] finding[.]

(*Laurel Heights Improvement Assn. v. Regents of the University of California* (1988) 47 Cal.3d 376, 409; see also *Eureka Citizens for Responsible Gov't v. City of Eureka* (2007) 147 Cal.App.4th 357, 372.)

Both trip- and tour-based assessments can be used as measures of transportation efficiency, using denominators such as per capita, per employee, or per person-trip.

Trip- and Tour-based Assessment of VMT

As illustrated above, a tour-based assessment of VMT is a more complete characterization of a project's effect on VMT. In many cases, a project affects travel behavior beyond the first destination. The location and characteristics of the home and workplace will often be the main drivers of VMT. For example, a residential or office development located near high quality transit will likely lead to some commute trips utilizing transit, affecting mode choice on the rest of the tour.

Characteristics of an office project can also affect an employee's VMT beyond the work tour. For example, a workplace located at the urban periphery, far from transit, can require an employee to own a car, which in turn affects the entirety of an employee's travel behavior and VMT. For this reason, when estimating the effect of an office development on VMT, it may be appropriate to consider total employee VMT if data and tools, such as tour-based models, are available. This is consistent with CEQA's requirement to evaluate both direct and *indirect* effects of a project. (See CEQA Guidelines, § 15064, subd. (d)(2).)

Assessing Change in Total VMT

A third method, estimating the *change in total VMT* with and without the project, can evaluate whether a project is likely to divert existing trips, and what the effect of those diversions will be on total VMT. This method answers the question, "What is the net effect of the project on area VMT?" As an illustration, assessing the total change in VMT for a grocery store built in a food desert that diverts trips from more distant stores could reveal a net VMT reduction. The analysis should address the full area over which the project affects travel behavior, even if the effect on travel behavior crosses political boundaries.

Using Models to Estimate VMT

Travel demand models, sketch models, spreadsheet models, research, and data can all be used to calculate and estimate VMT (see Appendix F of the preliminary discussion draft). To the extent possible, lead agencies should choose models that have sensitivity to features of the project that affect VMT. Those tools and resources can also assist in establishing thresholds of significance and estimating VMT reduction attributable to mitigation measures and project alternatives. When using models and tools for those various purposes, agencies should use comparable data and methods, in order to set up an "apples-to-apples" comparison between thresholds, VMT estimates, and VMT mitigation estimates.

Models can work together. For example, agencies can use travel demand models or survey data to estimate existing trip lengths and input those into sketch models such as CalEEMod to achieve more

accurate results. Whenever possible, agencies should input localized trip lengths into a sketch model to tailor the analysis to the project location. However, in doing so, agencies should be careful to avoid double counting if the sketch model includes other inputs or toggles that are proxies for trip length (e.g., distance to city center). Generally, if an agency changes any sketch model defaults, it should record and report those changes for transparency of analysis. Again, trip length data should come from the same source as data used to calculate thresholds to be sure of an "apples-to-apples" comparison.

Additional background information regarding travel demand models is available in the California Transportation Commission's "2010 Regional Transportation Plan Guidelines," beginning at page 35.

Appendix 2. Induced Travel: Mechanisms, Research, and Additional Assessment Approaches

Induced travel occurs where roadway capacity is expanded in an area of present or projected future congestion. The effect typically manifests over several years. Lower travel times make the modified facility more attractive to travelers, resulting in the following trip-making changes:

- **Longer trips.** The ability to travel a long distance in a shorter time increases the attractiveness of destinations that are farther away, increasing trip length and vehicle travel.
- **Changes in mode choice.** When transportation investments are devoted to reducing automobile travel time, travelers tend to shift toward automobile use from other modes, which increases vehicle travel.
- **Route changes.** Faster travel times on a route attract more drivers to that route from other routes, which can increase or decrease vehicle travel depending on whether it shortens or lengthens trips.
- **Newly generated trips.** Increasing travel speeds can induce additional trips, which increases vehicle travel. For example, an individual who previously telecommuted or purchased goods on the internet might choose to accomplish those tasks via automobile trips as a result of increased speeds.
- **Land Use Changes.** Faster travel times along a corridor lead to land development farther along that corridor; that new development generates and attracts longer trips, which increases vehicle travel. Over several years, this induced growth component of induced vehicle travel can be substantial, making it critical to include in analyses.

Each of these effects has implications for the total amount of vehicle travel. These effects operate over different time scales. For example, changes in mode choice might occur immediately, while land use changes typically take a few years or longer. CEQA requires lead agencies to analyze both short-term and long-term effects.

Evidence of Induced Vehicle Travel. A large number of peer reviewed studies[39] have demonstrated a causal link between highway capacity increases and VMT increases. Many provide quantitative estimates of the magnitude of the induced VMT phenomenon. Collectively, they provide high quality evidence of the existence and magnitude of the induced travel effect.

[39] See, e.g., Boarnet and Handy (Sept. 2014) Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions, California Air Resources Board Policy Brief, available at https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf; National Center for Sustainable Transportation (Oct. 2015) *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*, available at http://www.dot.ca.gov/research/researchreports/reports/2015/10-12-2015-NCST_Brief_InducedTravel_CS6_v3.pdf.

Most of these studies express the amount of induced vehicle travel as an "elasticity," which is a multiplier that describes the additional vehicle travel resulting from an additional lane mile of roadway capacity added. For example, an elasticity of 0.6 would signify an 0.6 percent increase in vehicle travel for every 1.0 percent increase in lane miles. Many of these studies distinguish "short run elasticity" (increase in vehicle travel in the first few years) from "long run elasticity" (increase in vehicle travel beyond the first few years). Long run elasticity is larger than short run elasticity, because as time passes, more of the components of induced vehicle travel materialize. Generally, short run elasticity can be thought of as excluding the effects of land use change, while long run elasticity includes them. Most studies find a long run elasticity between 0.6 and just over 1.0,[40] meaning that every increase in lanes miles of one percent leads to an increase in vehicle travel of 0.6 to 1.0 percent. The most recent major study finds the elasticity of vehicle travel by lanes miles added to be 1.03; in other words, each percent increase in lane miles results in a 1.03 percent increase in vehicle travel.[41] (An elasticity greater than 1.0 can occur because new lanes induce vehicle travel that spills beyond the project location.) In CEQA analysis, the long-run elasticity should be used, as it captures the full effect of the project rather than just the early-stage effect.

Quantifying Induced Vehicle Travel Using Models. Lead agencies can generally achieve the most accurate assessment of induced vehicle travel resulting from roadway capacity increasing projects by applying elasticities from the academic literature, because those estimates include vehicle travel resulting from induced land use. If a lead agency chooses to use a travel demand model, additional analysis would be needed to account for induced land use. This section describes some approaches to undertaking that additional analysis.

Proper use of a travel demand model can capture the following components of induced VMT:

- Trip length (generally increases VMT)
- Mode shift (generally shifts from other modes toward automobile use, increasing VMT)
- Route changes (can act to increase or decrease VMT)
- Newly generated trips (generally increases VMT)
    - Note that not all travel demand models have sensitivity to this factor, so an off-model estimate may be necessary if this effect could be substantial.

However, estimating long-run induced VMT also requires an estimate of the project's effects on land use. This component of the analysis is important because it has the potential to be a large component of

[40] See Boarnet and Handy (Sept. 2014) *Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions*, California Air Resources Board Policy Brief, p. 2, available at https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf.

[41] Duranton and Turner (2011) *The Fundamental Law of Road Congestion: Evidence from US cities*, available at http://www.nber.org/papers/w15376.

the overall induced travel effect. Options for estimating and incorporating the VMT effects that are caused by the subsequent land use changes include:

1. *Employ an expert panel.* An expert panel could assess changes to land use development that would likely result from the project. This assessment could then be analyzed by the travel demand model to assess effects on vehicle travel. Induced vehicle travel assessed via this approach should be verified using elasticities found in the academic literature.
2. *Adjust model results to align with the empirical research.* If the travel demand model analysis is performed without incorporating projected land use changes resulting from the project, the assessed vehicle travel should be adjusted upward to account for those land use changes. The assessed VMT after adjustment should fall within the range found in the academic literature.
3. *Employ a land use model, running it iteratively with a travel demand model.* A land use model can be used to estimate the land use effects of a roadway capacity increase, and the traffic patterns that result from the land use change can then be fed back into the travel demand model. The land use model and travel demand model can be iterated to produce an accurate result.

A project which provides new connectivity across a barrier, such as a new bridge across a river, may provide a shortened path between existing origins and destinations, thereby shortening existing trips. In rare cases, this trip-shortening effect might be substantial enough to reduce the amount of vehicle travel resulting from the project below the range found in the elasticities in the academic literature, or even lead a net reduction in vehicle travel overall. In such cases, the trip-shortening effect could be examined explicitly.

Whenever employing a travel demand model to assess induced vehicle travel, any limitation or known lack of sensitivity in the analysis that might cause substantial errors in the VMT estimate (for example, model insensitivity to one of the components of induced VMT described above) should be disclosed and characterized, and a description should be provided on how it could influence the analysis results. A discussion of the potential error or bias should be carried into analyses that rely on the VMT analysis, such as greenhouse gas emissions, air quality, energy, and noise.

APPENDIX B

PROPOSED MITIGATION STRATEGIES FOR IMPLEMENTATION OF SB 743

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Proposed Mitigation Strategies for Implementation of SB 743

Categories	Mitigation Strategies	Proposed Language
Tier 1 - **On-Site Improvements**	**1.** Pedestrian Network Improvements **2.** Incorporate Bike Lane Street Design **3.** Provide Traffic Calming Measures **4.** Increase density **5.** Provide enhanced bicycle and/or pedestrian facilities **6.** Mixed-Use Overlay **7.** Incorporate affordable housing **8.** Bike parking for non-residential projects or multi-unit residential projects	**1.** Pedestrian Network Improvements shall be incorporated into a project site plan that provide pedestrian walkway access from a building entrance/exit to other buildings on the project site and a sidewalk that leads off-site.[1] **2.** Projects that include dedicated rights-of-way, non-dedicated roadways, or both, shall be designed at an appropriate width to accommodate, at a minimum, a painted on-street Bike Lane. [2] **3.** Traffic Calming Measures (TCMs) shall be incorporated into a project site plan, where applicable. [3] **4.** A density bonus will be allowed in conformance with Orange County Zoning Code. [4] **5.** Projects with existing bicycle and pedestrian facilities shall double the capacity of bicycle facilities (e.g., bicycle racks) and shall expand pedestrian walkway access such that all onsite buildings are interconnected and off-street connectivity is provided. **6.** A density bonus shall be allowed if a project includes both residential and employment land uses. **7**. A density bonus shall be allowed if a project includes affordable housing per the Zoning Code. 8. Bicycle parking shall be provided in a secure, enclosed location and be identified on a site plan. The bike parking shall be provided based on duration for non-residential developments. [5]

Proposed Mitigation Strategies for Implementation of SB 743

Categories	Mitigation Strategies	Proposed Language
Tier 2 - **Financial Incentives**	**9.** Project contributions to infrastructure improvement projects **10.** School pool program **11.** Subsidize vanpool for housing developments **12.** Provide car-sharing, bike-sharing or ride-sharing programs **13.** Provide subsidized transit passes	9. Should a program be adopted in the future, this will be an option for Applicants. [6] **10**. Each residential project would provide new homebuyers with a flyer describing the time and cost savings of carpooling. [7] **11**. Each residential project would provide new homebuyers or resale homebuyers with vouchers for each applicable commercial vanpool service for the period of time they own the home. [8] **12**. Each residential project would provide new homebuyers or resale homebuyers with flyers detailing the car-sharing, bike-sharing, or ride-sharing programs, documenting the time and cost savings of each. Non-residential projects would provide each employee with this flyer and post the flyer in a lunch room or break room location. [8] **13**. Each residential project would provide new homebuyers or resale homebuyers with transit subsidies for the period of time they own the home. Non-residential projects would provide each employee with access to transit subsidies. [8]

Notes:

1. The Pedestrian Network Improvements should provide intra-project connectivity and connectivity off-site.

2. A Class II bike lane represents a minimum standard. Class I off-street bike paths or Class IV bike boulevards could also be included and may result in greater usage and a greater reduction in VMTs.

3. TCMs are going to vary significantly among project types (residential v. commercial, etc.) and the size of the project envelope, and the types of TCMs that could be included. Project applicants should ensure measures are appropriate for the proposed project.

4. The density bonus in the Zoning Code applies to residential. However, appropriate measures may be applied to a non-residential project at the discretion of the County where VMT reduction may result.

5. In accordance with the 2019 California Green Building Standards Code for non-residential developments, short-term bicycle parking will require 5% of motorized vehicle parking spaces with a minimum of one two-bike rack. Long-term bicycle parking will require 5% of tenant-occupant vehicular parking spaces with a minimum of one bike parking facility.

6. The particular type of infrastructure project should be determined, as some would be more applicable than others. Also, the fee increment would have to be calculated.

7. Actual metrics on how much time and money would be saved should be provided that are specific to the project area.

8. Coordination would be the responsibility of the project applicant.

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Attachment 4

III. LAND USE ELEMENT

CA/KB

OVERVIEW

The Land Use Element (LUE), one of nine elements of the restructured General Plan, contains official County policies on the location and character of land uses necessary for orderly growth and development. All elements have the same horizon year (2025) and growth assumptions to ensure internal consistency. The LUE identifies policies and programs in other County General Plan elements that affect land use and provide guidance for future land use planning studies for the unincorporated portion of the County.

The LUE is arranged as follows:

- Purpose of the Element
- Relationship to Other Elements
- Planning Constraints & Deficiencies
- Land Use Categories
- Building Intensity/Population Density Standards
- Existing Conditions
- Objectives & Policies
- Implementation Programs

CHAPTER III. LAND USE ELEMENT

PURPOSE OF THE ELEMENT

The Land Use Element describes objectives, policies, and land use patterns for all unincorporated territory in both narrative and graphic terms and establishes development criteria and standards, including population density and building intensity.

Land use categories are used to depict the general distribution, location, and extent of public and private uses of land. In accomplishing this primary purpose, the Land Use Element fulfills the requirements of Section 65302(a) of the California Government Code, which establishes it as a mandated element of the General Plan.

Through a combination of objectives, policies, and programs, the Land Use Element has three additional purposes. First, many of the goals of the General Plan can be achieved through the application of land use policies that are closely coordinated with Transportation Element policies, particularly those related to the County's multimodal transportation systems. These land use policies provide a basis for the evaluation of physical development and growth trends in order to achieve the General Plan goals. Second, these policies determine land use capacities and the appropriate level of public services and infrastructure necessary to support these capacities. Third, these land use policies and strategies ensure that the County accommodates various transportation choices to enable safe, attractive, and comfortable access and travel for all users, including people driving, walking, cycling, or taking transit, as well as children, seniors, and individuals with disabilities.

RELATIONSHIP TO OTHER ELEMENTS

State law requires the Land Use Element to achieve internal consistency with all elements of the General Plan. Although the Land Use Element provides the basis for land use decisions, it does not replace or supersede any of the other General Plan elements. Instead, the Land Use Element complements the other elements by incorporating and implementing their land use concerns and recommendations.

The Land Use Element supports the Resources Element's open space and natural resource plans through the designation of an Open Space land use category and an Open Space Reserve land use overlay. The Transportation, Recreation, Safety, and Housing elements are implemented by incorporating their land use recommendations into policies and programs.

The Land Use Element is also consistent with the Noise Element in that the land use plan reflects noise level concerns. Therefore, the Land Use Element, at the time of its adoption, is the most current expression of County land use policy and is internally consistent with the other General Plan elements.

PLANNING CONSTRAINTS & DEFICIENCIES

This section identifies existing and potential constraints upon achievement of the objectives and policies identified above and in the following chapters. While these constraints do not constitute absolute barriers, they may inhibit the timely achievement of the objectives.
These constraints have been categorized below into four categories: environmental, fiscal, economic and market constraints, and governmental constraints.

Environmental Constraints

Five major environmental conditions constrain development in Orange County: noise, floods, fires, geologic/seismic hazards, and natural and cultural resources. More detailed discussion of these constraints are found in the Noise, Safety, and Resources Elements (Chapters VIII, IX, and VI respectively).

NOISE

The major sources of significant noise in Orange County are aircraft and highway vehicles. While both can usually be mitigated to acceptable levels indoors, aircraft noise cannot be mitigated outdoors because of its overhead source. State law and County policy prohibit residential development and similar noise sensitive uses in high-noise (+65 CNEL) areas near John Wayne Airport.

Noise in nonresidential developments must be attenuated to protect users in these areas. Near major streets and highways, noise must also be attenuated. Thus, high-noise conditions may preclude certain uses in some areas and may increase development costs. CNEL noise contour maps and more detailed information related to noise are found in Chapter VIII, the Noise Element.

FLOOD HAZARDS

Portions of Orange County are located in floodplain areas of varying degrees of risk. Figure III-1a identifies areas subject to 100- and 500-year flooding as identified by the Flood Insurance Rate Maps (FIRM) provided by the Federal Emergency Management Agency (FEMA) and floodplain maps from the California Department of Water Resources (DWR). In many cases, development can occur in these areas through proper site planning, but costs may be high. There are, however, some areas where development is precluded because of extreme flood potential. In all development scenarios, water quality and watershed protection principles must also be considered in the site planning and stormwater facility design process.

FIRE HAZARDS

The foothill areas of Orange County are considered high to very high fire hazard

areas. Future development in these areas must minimize potential fire hazards and adequate fire protection must be maintained. Both these actions may raise development costs but will not preclude development. Figure III-1b depicts the location of these fire hazard areas.

GEOLOGIC/SEISMIC HAZARDS

Potential slope and seismic hazards constrain development in certain parts of the County. While both conditions seldom preclude development, they may increase the cost of construction.

Figure III-1c identifies areas subject to seismic hazards. Chapter IX, the Safety Element, further explores these hazards as well as other non-seismic hazards.

NATURAL & CULTURAL RESOURCES

The presence of natural or cultural resources on vacant land may influence its future use. For example, critical habitat areas or archaeological sites may require preservation or sensitive planning. Such conditions may preclude development or increase the cost of construction. For further information related to natural and cultural resources, please refer to the Chapter VI, the Resources Element.

Fiscal Constraints and Deficiencies

Based on data from the County's Development Monitoring Program, revenues from new development often do not fully offset the cost of public services needed to serve that development.

PUBLIC SERVICES

The loss of revenue resulting from Proposition 13 coupled with rising costs due to growth and inflation will continue to burden public service providers. If current trends continue, public service levels will deteriorate and new development may be delayed or precluded.

INCREASED DEVELOPMENT FEES AND REQUIREMENTS

Increased fees on new developments and the shift of responsibility for infrastructure provision to developers will increase construction costs and may reduce levels of production.

However, Transit-Oriented Development (TOD) could induce development on appropriate infill sites within urbanized areas, resulting in infrastructure cost savings because facilities and services are in place. TOD means more compact development, without the capital and operating costs of expanding water, sewage, and roads to serve development on vacant land outside urbanized areas. In addition, TOD offers long-term revenue potential as a result of a possible increase in property values within transit-served corridors where multimodal access has economic value and people

are willing to pay somewhat more, on the margin, to get it.

INFRASTRUCTURE ADEQUACY

While infrastructure imbalances have been reduced in recent years through development phasing the use of public facility development agreements and other mechanisms, infrastructure shortfalls do exist and may impede the fulfillment of the objectives. However, infill development, a common TOD strategy that entails building on skipped-over vacant or underutilized lots within existing urban areas, would promote using existing infrastructure to its fullest.

UNINCORPORATED DISADVANTAGED COMMUNITIES

Senate Bill 244, signed by Governor Brown on October 7, 2011, requires cities and counties to address the infrastructure needs of "disadvantaged unincorporated communities" in city and county general plans and in municipal service reviews prepared by Local Agency Formation Commissions. A disadvantaged unincorporated community is defined as a "fringe," "island" or "legacy" community with 12 or more registered voters in which the median household income is less than 80 percent of the statewide median. ("Fringe community" means any inhabited and unincorporated territory that is within a city's sphere of influence. "Island community" means any inhabited and unincorporated territory that is surrounded or substantially surrounded by one or more cities or by one or more cities and a county boundary or the Pacific Ocean. "Legacy community" means a geographically isolated community that is inhabited and has existed for at least 50 years.)

The law (GC Section 65302.10(a)) requires that on or before the adoption of its housing element, each city must identify and describe in its Land Use Element each "island community" or "fringe community" that exist within the city's sphere of influence that is a disadvantaged unincorporated community. (A city's sphere of influence boundary is determined by the Local Agency Formation Commission and defines the logical, long-term service area for that agency.) Cities are required to include an analysis of water, wastewater, storm water drainage and structural fire protection needs or deficiencies for each of the identified communities in the land use element. In addition, cities must include an analysis in the Land Use Element of potential funding mechanisms that could make the extension of services and facilities to identified communities financially feasible (GC Section 65302.10(a)).

County Land Use Elements are required to

identify and describe each "legacy community" within the boundaries of the county that is a disadvantaged unincorporated community, but *not* including any areas with the sphere of influence of a city (GC Section 65302.10(a)).

In December 2011, the Orange County Local Agency Formation Commission (LAFCO), in cooperation with the Center for Demographic Research at California State University, Fullerton, reviewed recent Census data and identified two disadvantaged unincorporated island communities within Orange County: (1) the Southwest Anaheim Island located within the City of Anaheim sphere of influence, and (2) the Katella/Rustic Island located with the City of Stanton sphere of influence. The City of Anaheim and the City of Stanton will each be required to include an analysis of the infrastructure needs/deficiencies and potential funding opportunities to extend infrastructure upgrades to these areas, if needed, in their respective general plan land use elements.

No disadvantaged unincorporated "legacy communities" were identified within Orange County. The County is not required to include additional analysis in its Land Use Element (as provided in SB 244) if these communities are not present.

Economic and Market Constraints

During the last six years, the Orange County economy has undergone some very significant transformations. In the first three years of the previous decade (1990-1993), the County lost an estimated 57,000 jobs, which translated into approximately five percent of its employment base. During this period, the hardest hit employment sectors were construction, international trade and durable goods manufacturing. The County also experienced a significant decline in housing prices, which led to mortgage delinquencies and declining land values.

However, this broad decline established the basis for a broad diversification of the economy and economic rebound that began in 1994. Since the recession "bottomed out" in 1993, the County has added an estimated 100,000 new jobs, almost doubling the number of jobs lost in the first three years of the decade.

In addition, the jobs that have replaced the lower-skilled manufacturing jobs are higher paying and provide goods and services relating to software development and information technology. The objectives established by this Element assume sustained economic growth for Orange County.

Figure III-1a

Figure III-1b

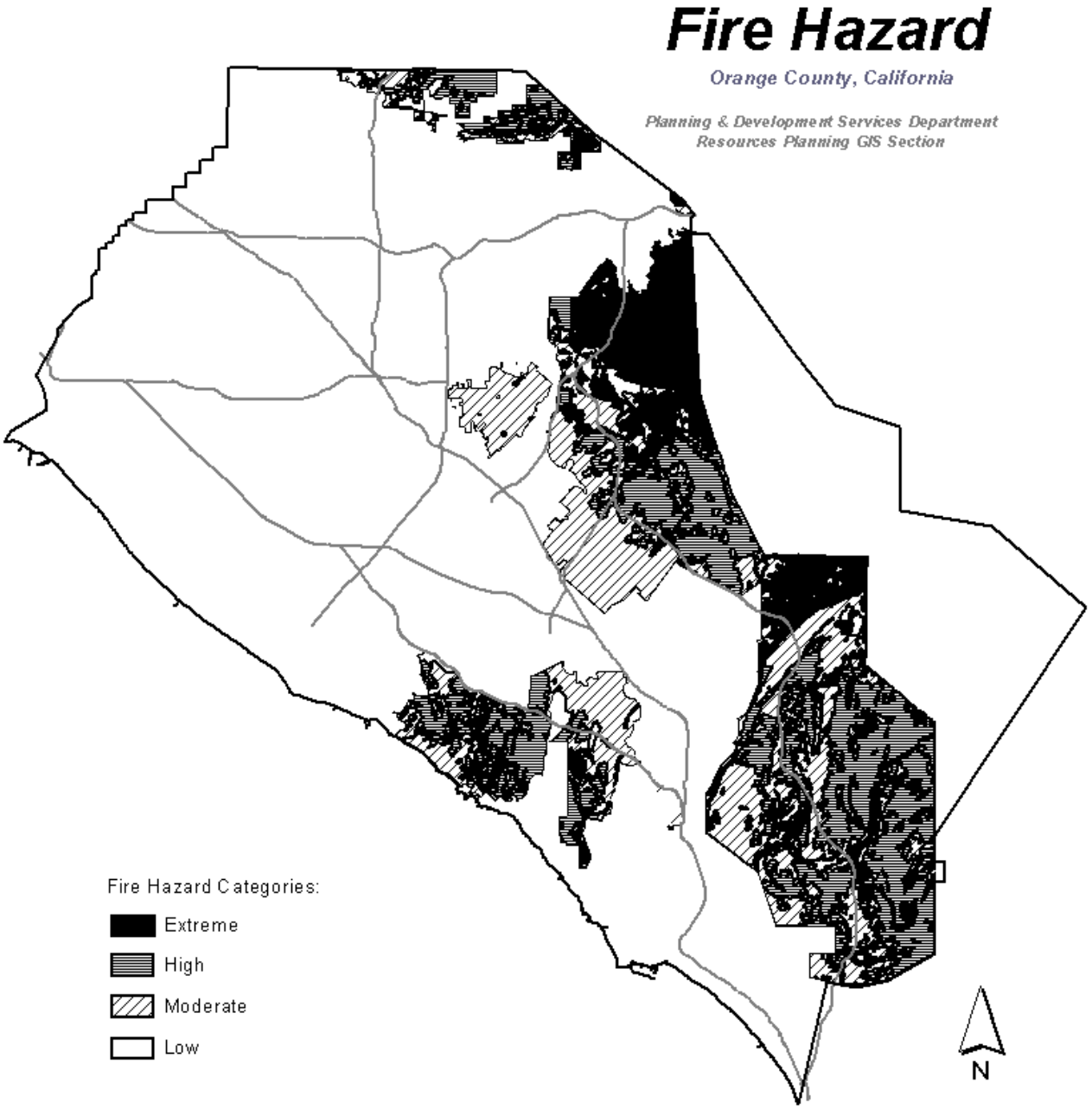
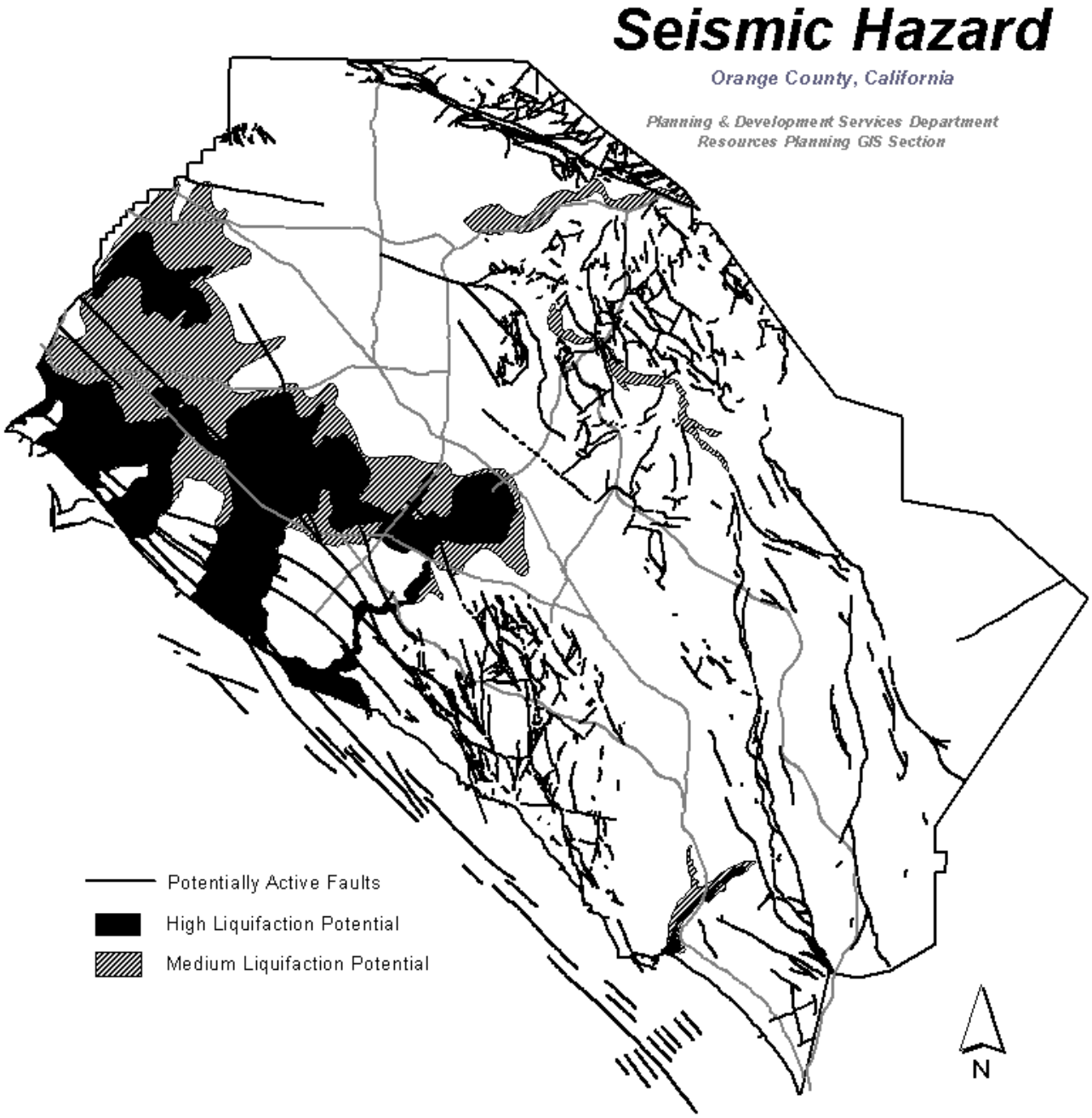


Figure III-1c



LAND AVAILABILITY

Land availability significantly impacts future growth levels. If land costs increase dramatically or if adequate amounts of land cannot be brought to the market, development will be constrained.

REAL ESTATE AND DEVELOPMENT FINANCING

A steady supply of credit to finance new construction is critical to the policy plan objectives.

Governmental Constraints

COMPETING PRIORITIES

Competing public needs can result in conflicting priorities and programs. Conflicts such as open space preservation, housing production, transit-oriented development neighborhood protection could constrain efforts to achieve the objectives if they remain unresolved.

INTERGOVERNMENTAL CONFLICTS

State and federal agency actions or requirements and land ownership by these agencies constitute constraints to development. Existing examples include the state Coastal Commission and Cleveland National Forest, while state policies regarding prime agricultural land preservation and mineral resource protection may function as future constraints.

LAND USE CATEGORIES

The land use categories described below and depicted in Map III-1, the Land Use Designations, provide broad guidance directing the development of Orange County.

Residential

The residential land use categories identify those areas suitable for residential development. Residential uses are divided into categories on the basis of density, relation to the County's street system and to transit, compatibility with the natural terrain, and conformance with the County's residential growth projections. Housing types ranging from rural, large-lot estates in outlying areas to high-density residential units in appropriate urban locales are encouraged.

The broad residential categories include allowances for local and community open space, local schools, childcare facilities, neighborhood commercial centers, and other facilities needed for neighborhood services, as well as for trails and complete streets to improve neighborhood access and connectivity to other land uses.

Neighborhood/convenience commercial sites are assumed to be consistent with Suburban Residential areas, subject to the Neighborhood Commercial guidelines contained herein. These sites are not identified on the Land Use Map.

Neighborhood Commercial Guidelines:

The following guidelines are to be used in evaluating development plans that contain neighborhood commercial proposals:

1. To encourage the development of commercial activities in centers with unified planning, design, and facilities (such as parking, ingress and egress).
2. To locate commercial development at intersections of primary and secondary streets wherever possible. When local commercial development must be located adjacent to major intersections, access should be from the lesser of the two arterials.
3. To locate commercial development so that wherever possible, it is centrally located within its service area.
4. To locate commercial sites at an optimal distance from regional and community commercial centers.
5. To locate, generally, neighborhood commercial centers one mile apart.
6. To encourage adequate pedestrian and bicycle connections to neighborhoods and adjacent retail and service uses.
7. To accommodate all modes of transportation by incorporating appropriate design features and supporting development of a comprehensive trails and bike system.
8. To manage parking efficiently and provide easily accessible and well-designed bicycle parking.
9. To set a general standard of one acre of commercial development per 1,000 people in the service area. Because there are no absolute criteria for neighborhood commercial acreage needed to adequately service a given number of people, this standard should be tempered by the character of each particular area.
10. To set a general standard of three to ten acres for neighborhood commercial developments.
11. To require the developer of a commercial center to provide a statistical demand analysis of the market service area at the time of the zoning request in order to assist in determining its adequacy and appropriateness.
12. To review regularly and evaluate excessive undeveloped commercial zoning for its appropriateness and its ability to serve the County.

The residential categories are intended for application to all areas so designated on the Land Use Designations figure with one exception. Where Planned Community Districts or specific plans have been adopted but are not reflected in detail at the General

Plan level the overall density and character represented on the Land Use Element Map are assumed to reflect the Planned Community District or Specific Plan regulations.

- ***RURAL RESIDENTIAL (1A)***

  This category is applied to areas in which limited residential use is compatible with the natural character of the terrain.

  Development under this category will require special consideration due to topography and other factors.

  The building intensity standard for Rural Residential ranges from 0.025 to 0.5 dwelling units per gross acre (DU/AC).

- ***SUBURBAN RESIDENTIAL (1B)***

  These areas are characterized by a wide range of housing types, from estates on

Insert Map III-1 (Land Use Map)

Left blank for Map III-1 (11x17)

Insert Map III-2 (Spheres of Influence)

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large lots to attached dwelling units (townhomes, condominiums, and clustered arrangements).

This category permits the greatest flexibility for residential development. Building intensity for Suburban Residential ranges from 0.5 to 18.0 DU/AC.

- ***URBAN RESIDENTIAL (1C)***

  This category is applied to areas where intensive residential development is compatible with surrounding urban development.

  Development within this category is characterized by intensive residential uses such as apartments, condominiums, townhomes and clustered residential units.

  Building intensity for Urban Residential is 18 DU/AC and above.

Commercial

Commercial land uses are depicted on the

Land Use Element Map as either Community Commercial or Regional Commercial uses. The designated areas relate to commercial opportunities rather than to specific development sites.

Generally, commercial development occurs in centers sited along arterial highways or at intersections of arterial highways and serves a specified threshold population. Ideally, commercial development should be sited at locations accessible to all transportation modes, where the infrastructure promotes a safe means of travel for all users along the right of way.

- ***COMMUNITY COMMERCIAL (2A)***

  This category designates land for commercial development that provides a wide range of facilities for convenience goods and retail trade including tourist recreation businesses, and community services (e.g., childcare facilities). Generally, community commercial development is limited in scope to approximately 10 to 40 acres and is intended to serve a market area exceeding 20,000 persons.

  Supermarkets, healthy food retail, restaurants, movie theaters and banks are typical tenants of a community commercial center.

- ***REGIONAL COMMERCIAL (2B)***

  This category identifies major, high-intensity commercial activities requiring centralized locations in order to serve large urban populations at the regional or sub-regional level.

  Regional commercial centers generally range between 75 and 125 acres in size and serve a market area in excess of 100,000 persons. Normally, tenants within a regional center include major department stores and specialty shops. Childcare facilities will be permitted, if appropriate.

Employment

The Employment (3) land use category identifies areas intended for use by employment generators, usually light and service industries or professional-administrative office uses.

These activities are characterized by few nuisance or hazard problems. It is intended that the locations of individual employment facilities be compatible with one another and with surrounding areas. These locations should be transit accessible. Opportunities for transportation demand management (TDM) are promoted to reduce future congestion and facilitate access to transit. Street design may include features and techniques that promote safe and comfortable travel by pedestrians, bicyclists and public transportation riders.

Materials recovery/recycling facilities may be permitted, if appropriately located and found to be compatible with surrounding uses. Employment generators and commercial uses should locate together in well-defined urban activity centers.

Childcare facilities will be permitted, if appropriate.

Public Facilities

The Public Facilities (4) land use category identifies major facilities built and maintained for public use. Included are civic buildings, airports, community colleges, military installations, correctional institutions, hospitals, solid waste facilities, water facilities, and sewer facilities. Childcare facilities will be permitted, if appropriate. In this category, the County supports alternative transportation to help promote a sense of neighborhood or community and an improved feeling of well-being through social interaction and better transportation access.

- ***SOLID WASTE FACILITIES - LANDFILL SITES (LS)***

This overlay category identifies existing solid waste facilities. When the Solid Waste Facility - Landfill Site (LS) overlay is applied to a land use category the overlay indicates that the current and near-term use of the land shall be limited to landfill operations, which may include materials recovery/ recycling facilities, and accessory uses (e.g., borrow site areas, buffer areas, access roads) until the completion of landfill site operations and closure of the landfill facility.

Open Space

This broad category includes the Open Space (5) land use category and the Open Space Reserve (OSR) land use overlays.

The Open Space (5) category indicates the current and near-term use of the land, most of which is zoned agricultural. It is not necessarily an indication of a long-term commitment specific uses, except where one of the three overlay categories applies.

The Open Space Reserve (OSR) overlay identifies lands of scenic and natural attraction, and areas of ecological, cultural, historical and recreational significance that are permanently preserved as and restricted to open space and compatible uses.

The allowable uses within the Open Space (5) and OSR designation are further defined in table III-1.

Open Space (5) category provides for limited land uses that do not require a commitment of significant urban infrastructure. Examples of compatible uses include:

- Land containing non-renewable and renewable resource areas, prime agricultural soils and water resource areas.
- Materials recovery/recycling facilities if the design of the facility does not adversely impact its open space surroundings, or if the facility

is operated in conjunction with other refuse-oriented facilities (i.e. landfills).

- Employment uses in conjunction with large open space areas if they are consistent with the open space character of the area. The intent is to create opportunities for low-intensity, high technology, industrial, research and development, office and educational uses and childcare facilities which do not require a commitment of significant urban infrastructure and are accessible to all modes of transportation.

Generally, building sites within this category should be large; the area covered by structures and parking should not exceed 20% in order to blend development with the natural surroundings. Innovative design solutions are encouraged to incorporate buildings and parking into the natural features of the site as well as to maximize the efficient use of energy.

Areas identified Open Space (5) are not necessarily committed to permanent open space uses. Certain property within the Open Space categories is committed, through public or private ownership, to remain as open space, but other property, due to market pressures to serve a growing County population may ultimately be developed in other ways

- ***OPEN SPACE RESERVE (OSR)***

  The Open Space Reserve (OSR) designation is intended to reflect the Resources and Recreation Elements of the General Plan. It identifies major parks, beaches, forests, harbors and other territory that is to remain open space. It may also include recreational trails and similar facilities for alternative transportation. The OSR depiction on the General Plan maps show generalized reserve boundaries that are for informational purposes only and may not include private in-holding land.

Urban Activity Center

The Urban Activity Center (6) land use category identifies locations intended for high-intensity mixed-use development. Appropriate land uses include, but are not limited to, residential, commercial, and office uses; industrial parks and materials recovery/recycling facilities; civic, cultural, and educational uses; and childcare facilities.

This category is intended to facilitate a more efficient use of existing and future transportation systems, conserve energy resources, and develop residential densities which enhance the ability to provide affordable housing. Providing multi-modal access, implementing Transportation Demand Management measures, and employing appropriate parking management strategies are vital to the viability of Urban Activity Centers.

Urban Activity Centers are characterized by a diversity of housing opportunities including owner-occupied, rental, and affordable units with an emphasis on higher-density development; the vertical and horizontal mixing of retail, office, and residential uses; the development of mid-rise structures accommodating both residential and employment activities; accommodating all transportation modes, as appropriate; ensuring good neighborhood connectivity; and the inclusion of cultural, civic, educational, and urban recreational uses promoting both daytime and evening activities. Urban Activity Centers are located adjacent to major transportation corridors and are accessible to public transit facilities and to adjacent neighborhoods.

A goal of this category is to foster around-the-clock activity by encouraging the mixing of activities that people can easily walk to within the center, thereby reducing the impacts on the transportation system, improving neighborhood cohesion and community safety.

The full development of an Urban Activity Center is a long-term process (probably in excess of 20 years) due to its complexity and its size. Interim uses may, therefore, be appropriate. It will also be necessary to apply special development regulations, tailored to each center, to ensure that the ultimate development pattern is consistent with the intent of the category.

Childcare Centers

Childcare facilities are permitted in any land use category but are subject to review for appropriateness. Childcare centers, as defined by Health and Safety Code Section 1596.76, must obtain a license from the State Department of Social Services before beginning operations. Additional State licensing requirements (Title 22 of the California Administrative Code, Division 12 and other various sections) concern facility

design and facility operation. Present County practices enhance the provision of childcare facilities through increased coordination between State regulations, County policy documents, and local land use concerns.

Materials Recovery/Recycling Facilities

Materials recovery/recycling facilities are most appropriate in the land use categories of employment, urban activity center, and open space (when consistent with the character of the area). Materials Recovery Facilities (MRFs) must obtain permits from the Local Enforcement Agency (LEA) before beginning operations. LEA review includes facility design and operation.

County procedures serve to facilitate siting of recovery/recycling facilities through increased acknowledgment of State and local mandates in policy documents and streamlined discretionary permit review. The County's discretionary review of materials recovery/recycling facilities serves to address local concerns and any restrictions or conditions which may apply to specific land use categories.

BUILDING INTENSITY/ POPULATION DENSITY

STANDARDS

The General Plan, as required by Government Code §65302(a), must contain standards for building intensity and population density for each of the land use categories identified in the Land Use Element. Table III-1 lists types of permitted land uses, building intensities, and indicators of population densities for each land use category.

Building Intensity

Building intensity refers to the degree of development possible within each land use category. These standards refer to the maximum amount of development permitted for each land use designation. Development must also comply with the County of Orange Zoning Code or Specific Plan requirements, and is not guaranteed to achieve the designated intensity.

The standard for building intensity for residential land use categories is stated as the number of dwelling units per gross acre[1] (DU/AC). Residential building intensity in excess of the standards identified in Table III-1 may be accomplished, in certain circumstances, through a residential density bonus. Residential density bonuses may be considered for projects meeting certain

[1] "Gross acre" is defined as the total acreage within a project which is devoted to principal uses including, but not limited to, building sites, local streets, driveways, private recreation areas, ordinance required local park land, additional publicly-and privately-owned open space within project areas, minor easements serving the project, and customary uses and structures accessory to residential development.

affordability criteria and/or providing housing for senior citizens. The residential building intensity/density standards are intended to apply to broad geographic designations for residential land use shown on the Land Use Map and include allowances for land for public streets and other rights of way and storm drainage that may be dedicated to the County. The County's zoning regulations establish detailed requirements for land use and development standards for building height, setbacks, and the number of dwelling units permitted within individual zoning districts. Site-specific General Plan amendments are not required if a project fulfills certain conditions. First, the proposed development is on a small site, generally less than five acres, and does not exceed the average density range for surrounding geographic area where the General Plan land use designation applies. Second, the project conforms to the applicable zoning, which has been determined to be consistent with the General Plan.

Standards for building intensity are also stated in terms of maximum allowable floor-area ratios (FAR) for commercial, employment, and public facilities land use categories. FARs indicate the ratio of gross building square footage permitted on a parcel to gross square footage of the parcel.

For example, on a parcel with 10,000 net square feet of land area, a FAR of 1.00 will allow 10,000 square feet of gross square feet of building floor area to be built, regardless of the number of building floors (e.g. 5,000 square feet per floor on two floors or 10,000 square feet on one floor). On the same lot, a FAR of 0.5 would allow 5,000 square feet of floor area and a FAR of 0.25 would allow 2,500 square feet. Figure III-2 illustrates how buildings of one, two and four stories could be developed on a given parcel with a FAR of 1.0.

The standard for building intensity for Open Space is defined by maximum building height and maximum lot coverage.

Building intensity standards for Urban Activity Centers are stated as DU/AC and as the number of persons per acre. This can be calculated by multiplying the number of dwelling units per acre by the average number of persons per dwelling unit[2].

[2] "Average persons per dwelling unit" factors used to calculate residential population density" are determined by 1990 U.S. Census data. The persons per acre ranges are offered as an indicator of residential population density and do not restrict occupancy of units.

TABLE III-1. BUILDING INTENSITY/ POPULATION DENSITY STANDARDS

CATEGORY	TYPICAL CHARACTERISTICS/USES	INTENSITY/DENSITY CHARACTERISTICS AND STANDARDS*
Rural Residential (1A)	• Limited residential use compatible with the natural character of the terrain • Development may require special consideration due to topography and other factors	• 0.025 to 0.5 Dwelling Units per Acre (DU/AC) • 3.21 Persons per DU • 0-2 Persons Per Acre
Suburban Residential (1B)	• Wide range of housing types, from estates on large lots to attached dwelling units (townhomes, condominiums, and clustered arrangements) • Permits the greatest flexibility for residential development	• 0.5 to 18.0 DU/AC • 2.59 Persons per DU • 1-47 Persons per Acre
Urban Residential (1C)	• Intensive residential uses such as apartments, condominiums, townhomes and clustered residential units	• 18 and above DU/AC • 1.99 Persons per DU • >36 Persons per Acre
Community Commercial (2A)**	• Provides a wide range of facilities for convenience goods and retail trade including tourist recreation businesses, and community services (i.e., childcare facilities) • Typical tenants include supermarkets, restaurants, movie theaters and banks	• Generally limited in scope to approximately 10 to 40 acres • Intended to serve a market area exceeding 20,000 persons • 0.50 FAR • 45 Employees per Acre
Regional Commercial (2B)**	• Identifies major, high-intensity commercial activities requiring centralized locations in order to serve large urban populations at the regional or subregional level • Typical tenants include major department stores and specialty shops • Childcare facilities will be permitted, if appropriate. • Greater intensity may be permitted in transit-served areas provided identified impacts are mitigated.	• Generally range between 75 and 125 acres in size • Serves a market area in excess of 100,000 persons • 0.50 FAR or more in transit-served areas • 45 Employees per Acre

CATEGORY	TYPICAL CHARACTERISTICS/USES	INTENSITY/DENSITY CHARACTERISTICS AND STANDARDS*
Employment (3)**	• Typical tenants include employment generators, usually light and service industries or professional-administrative office uses • Characterized by few nuisance or hazard problems • Locations of individual employment facilities intended to be compatible with one another and with surrounding areas • Greater intensity may be permitted in transit-served areas provided identified impacts are mitigated. • Materials recovery/recycling facilities permitted, if appropriately located and compatible with surrounding uses • Childcare facilities permitted, if appropriate	• 0.75 FAR or more in transit-served areas • 130 + Employees per Acre

CATEGORY	TYPICAL CHARACTERISTICS/USES	INTENSITY/DENSITY CHARACTERISTICS AND STANDARDS*
Public Facilities (4)**	• Identifies major facilities built and maintained for public use • Facilities include civic buildings, airports, community colleges, military installations, correctional institutions, hospitals, solid waste facilities, water facilities, and sewer facilities • Childcare facilities will be permitted, if appropriate.	• 0.75 FAR or more in transit-served areas • 130+ Employees per Acre • Buildings permitted within this category typically reflect a wide range of intensity/density characteristics • Airports, correctional institutions, water and sewer facilities generally have a low FAR and employee per acre ratio. Civic buildings such as city halls, however, can be comparable to offer developments built within the Employment (3) land use category which reflect higher FARs and employee occupancy. • The FAR and employee per acre standards for the Public Facilities (4) category reflect the intensity/density characteristics of typical office development to allow for the full range of land uses permitted in this category.

CHAPTER III. LAND USE ELEMENT

CATEGORY	TYPICAL CHARACTERISTICS/USES	INTENSITY/DENSITY CHARACTERISTICS AND STANDARDS*
*Landfill Site (LS)***	• Identifies existing and planned solid waste facilities • Indicates that the current and near-term use of the land shall be limited to landfill operations, which may include materials recovery/recycling facilities, and accessory uses (e.g., borrow site areas, buffer areas, access roads) until the completion of landfill site operations and closure of the landfill facility	
Open Space (5)**	• Indicates the current and near-term use of the land, most of which is zoned agricultural • Provides for limited land uses that do not require a commitment of significant urban infrastructure • Examples of compatible uses include: • Land containing non-renewable and renewable resource areas, prime agricultural soils and water resource areas • Materials recovery/recycling facilities if the design of the facility does not adversely impact its open space surroundings, or if the facility is operated in conjunction with other refuse-oriented facilities (i.e., landfills) • Employment uses in conjunction with large open space areas if they are consistent with the open space character of the area • Opportunities for low-intensity, high technology, industrial, research and development, office and educational uses and childcare facilities which do not require a commitment of significant urban infrastructure	• Generally, building sites within this category should be large • Max. Bldg. Height: 35’ • Max. Site Coverage: the area covered by structures and parking should not exceed 20% in order to blend development with the natural surroundings. • 9 Employees per Acre

CATEGORY	TYPICAL CHARACTERISTICS/USES	INTENSITY/DENSITY CHARACTERISTICS AND STANDARDS*
*Open Space Reserve (OSR)***	• Identifies major parks, beaches, forests, harbors and other territory that will always remain open space, including urban regional parks, wilderness regional parks, and County wilderness areas. • An urban regional park may include, but shall not be limited to, one or more of the following recreational facilities: public and private sport centers, play fields, golf courses, riding and hiking trails, County bikeways, and swimming facilities, as well as passive activities and other day uses, including existing and expanding generally naturalized and created through landform and alteration and planting; special funding mechanisms, such as concessionaire and private funding may be available for construction and ongoing maintenance of the facilities. • The OSR depiction on the General Plan maps show generalized reserve boundaries that are for informational purposes only and may not include private in-holding land.	• Max. Bldg. Height: 18', except for Orange County's Central Park, where the maximum building height shall be 50' (except that 10% of all structures at ultimate development may be up to 100'). • Max. Site Coverage: 10%, except for Orange County's Central Park, where the maximum site coverage shall be 10% calculated exclusive of parking lots.

CHAPTER III. LAND USE ELEMENT

CATEGORY	TYPICAL CHARACTERISTICS/USES	INTENSITY/DENSITY CHARACTERISTICS AND STANDARDS*
Urban Activity Center (6)**	• Identifies locations intended for high-intensity mixed-use development designed to enable people to walk to uses within the center and to transit facilities serving the center • Appropriate land uses include, but are not limited to, residential, commercial, office, industrial park, materials recovery/recycling facility, civic, cultural, educational facilities, and childcare facilities • Characterized by a diversity of housing opportunities at various densities and at all income levels; the vertical and horizontal mixing of retail, office, and residential uses; the development of mid-rise structures accommodating both residential and employment activities; and the inclusion of cultural, civic, educational, and urban recreational uses promoting both daytime and evening activities; and support for transit-oriented development and all transportation modes • Located adjacent to major transportation corridors and accessible to public transit facilities; supports development of and links to trails and a countywide bike system. • Ensures that sidewalks, crosswalks, public transportation stops and facilities and other aspects of transportation right of way are compliant with the Americans with Disabilities Act and meet the needs of people with different types of disabilities including mobility impairments, vision impairments, hearing impairments and others. • Full development of an Urban Activity Center is a long-term process (probably in excess of 20 years) due to its complexity and size. Interim uses may, therefore, be appropriate • Necessary to apply special development regulations, tailored to each center, to ensure that the ultimate development pattern is consistent with the intent of the category	<u>Residential Uses</u> • 18 and above DU/AC • >36 Persons per Acre <u>Non-Residential Uses</u> • 0.75 FAR or more in transit-served areas • 130 + Employees per Acre • Intensity bonus available for transit-oriented development provided identified impacts are mitigated

* These standards refer to the maximum amount of development permitted for each land use designation. Development must also comply with the Zoning Code or Specific Plan requirements, and is not guaranteed to achieve the designated intensity.

** Estimated employees per acre for non-residential land use categories are calculated using FARs, the following building square footage per employee factors, and the following formula:

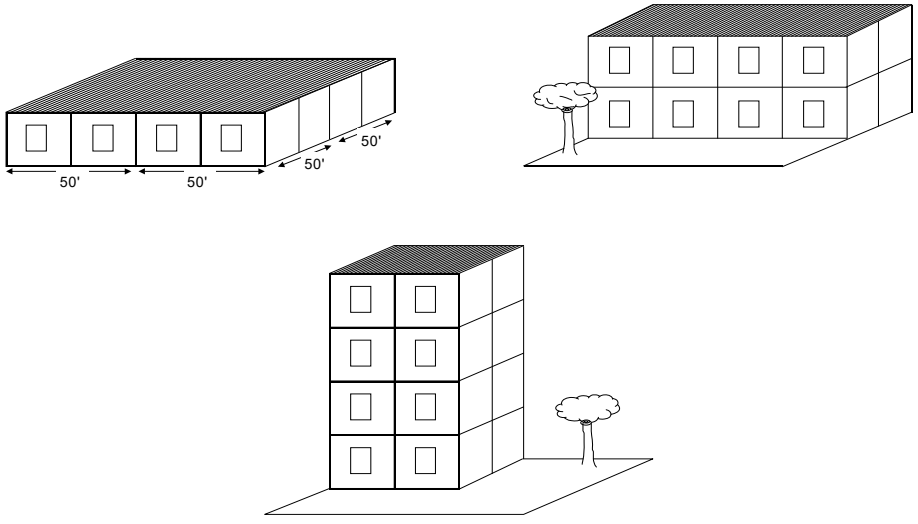
(FAR x 43,560 sf per acre) ÷ (sf per employee factor) = employees per acre

Commercial	500 sf/emp
Public Facilities	250 sf/emp
Employment	250 sf/emp
UAC	250 sf/3mp
Open Space	Not applicable

Estimates of population density for nonresidential land use categories are stated as employees per acre. Since Urban Activity Centers include both residential and nonresidential land uses, persons per acre and employees per acre are used as population density estimates.

Figure III-2

FLOOR AREA RATIO = 1.0



EXISTING CONDITIONS

Table III-2 provides a summary of acreage for each of the General Plan land use categories.

AGGREGATED LAND USE CATEGORIES		
LAND USE	**ACRES**	**% OF TOTAL**
RURAL RESIDENTIAL (1A)	13,421	7.6
SUBURBAN RESIDENTIAL (1B)	26,705	15.1
URBAN RESIDENTIAL (1C)	136	.08
COMMUNITY COMMERCIAL (2A)	52	.03
EMPLOYMENT (3)	113	.06
PUBLIC FACILITIES (4)	2,460	1.4
LANDFILL SITE (4LS)	2,057	1.2
OPEN SPACE (5)	130,433	74
URBAN ACTIVITY CENTER (6)	932	.53
TOTAL	176,309	100

OBJECTIVES AND POLICIES

This section presents the future objectives and policies of the Land Use Element.

Market forces will determine which areas develop first and which remain undeveloped or underdeveloped by the 2025 horizon year. However, the policy projections and the Land Use Element Map will be the tools for project evaluation and consistency determination to ensure that development coincides with the policies of the Land Use and Transportation Elements regarding infrastructure provision.

This section describes thirteen major land use policies that guide implementation of the Land Use Element. The intent of these policies is to articulate issues that should be addressed when considering development proposals.

These policies are implemented through the programs contained in the Implementation Programs section. Two LUE interpretive policies that guide administration of the LUE map and land use categories are described in the section immediately following these thirteen land use policies.

MAJOR LAND USE ELEMENT POLICIES

The fifteen major land use policies set forth in this section apply to all geographic areas of the unincorporated portion of the County. They are adopted for the purpose of guiding the planning and development of those areas for both the short-term and long-term future.

Each policy has been stated in a single sentence. A policy can be referred to by its short title. A statement of purpose for each policy is given to aid in its interpretation.

1. BALANCED LAND USE

To plan urban land uses with a balance of well-connected residential, industrial, commercial, and public land uses.

The purpose of the Balanced Land Use Policy is to ensure that communities at all levels are developed in a manner whereby residential, industrial, commercial, and public land uses are proportionally balanced and well-connected, accommodating all modes of travel. This balance is intended to aid in developing a sense of community by distributing the various land uses and employment base more evenly throughout the County, reducing the impacts on the County's transportation system, making it easier and safer for people to walk, bike and use transit, and positively affecting air quality. This policy does not require completely self-contained communities.

2. PHASED DEVELOPMENT

To phase development consistent with the adequacy of public services and facilities within the capacity defined by

the General Plan.

The purpose of the Phased Development Policy is to ensure that development coincides with the adequacy of public services and facilities, especially where the public health, safety, and welfare are concerned.

Proper phasing of new development within the designated General Plan capacity through the provision of public services and facilities is necessary to ensure that new development will not overload the existing facilities or be allowed to be completed without adequate facilities. Phasing should be a basic minimum requirement for land use intensification.

3. INFILL AND TRANSIT-ORIENTED DEVELOPMENT

To encourage infill and transit-oriented development through incentives, concentrating development close to transit stops and ensuring access by all travel modes.

The purpose of the Infill and Transit-Oriented Development (TOD) Policy is to promote compact, mixed use development in already urbanized areas near transit and to provide various safe and easy transportation options that will make it safe and easy for people to walk, ride bikes and use transit. Incentives available in "Transit Priority Areas," as identified in SCAG's Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) may include density and intensity (FAR) bonuses for TOD and infill development, pedestrian amenities, and employer-provided bicycle facilities. Walking, biking, and transit riding can be facilitated and encouraged through integrated physical planning, reduced fares for eligible riders, pedestrian-oriented street-level design, and street design features, such as protected bike lanes, wide shoulders, and street trees. Reduced parking may be approved in transit-served areas and in centers offering common and shared parking facilities, or providing bike or car sharing locations.

The incorporation of Vehicle Miles Traveled (VMT) into the Transportation Impacts analysis for California Environmental Quality Act review, through SB 743, promotes infill development, encourages multimodal transportation networks, and reduces GHG emissions

4. HOUSING DENSITIES

To provide a variety of residential densities which permit a mix of housing opportunities affordable to the county's labor force.

The purpose of the Housing Densities Policy is to provide a wide range of

housing densities within the unincorporated County that will permit a mix of housing opportunities, including both rental and ownership housing. The mix of densities is intended to make it possible to develop housing which is affordable to the County's labor force and offer those who work here a reasonable choice of living accommodations. In addition, transit-oriented development and projects designed to promote walkability and transportation choices may be supported through housing density bonuses.

SB 743, which adopted VMT for Transportation Impact CEQA analysis encourages density bonuses as a potential mitigation strategy. In particular, a density bonus shall be allowed if a project includes both residential and employment land uses, and if a project includes affordable housing.

5. LAND USE/TRANSPORTATION INTEGRATION

To plan an integrated land use and transportation system that accommodates travel demand for all modes of transit.

The purpose of the Land Use/ Transportation Integration Policy is to ensure that transportation planning is assimilated into the land use planning process. The transportation system should support the land use plan as a whole, and individual circulation links should be in balance with localized land uses in order to provide an adequate transportation system for the County with diverse transportation choices enabling safe, comfortable and attractive access for all users. When local or regional imbalances occur or when safety is an issue, development should be deferred until appropriate improvements to the circulation system can be provided or adequate project mitigation measures can be developed (e.g., improvements for public safety, such as better lighting, sidewalks and crosswalks, and traffic calming, public transit, employee housing programs, pedestrian and bicycle connections, and Safe Routes to Schools improvements undertaken by the County in partnership with local jurisdictions and local transportation agencies). Design principles that will guide implementation of this policy are shown on the following page. Also, the "2020 Updated Transportation Implementation Manual" includes an attachment that provides examples of potential mitigation. It is not an exhaustive list of feasible mitigation measures that may be applied to a project. As in previous CEQA practice, the applicant/project proponent will be required to identify mitigation measures to reduce, avoid, or offset the specific project-related impacts identified in an individual environmental document.

6. COMMERCIAL AND INDUSTRIAL CENTERS/TRANSPORTATION ACCESS

To locate major commercial and industrial centers in areas that are easily accessible to existing or planned major transportation facilities.

The purpose of the Commercial and Industrial Centers/Transportation Access Policy is to ensure that major commercial and industrial centers are convenient and accessible to existing or planned major transportation facilities, bicycle and pedestrian circulation, and the County's transit systems. These centers act as traffic attractors. Accessibility should be enhanced by intensive corridors and increased public transit, incentives for employer-provided bicycle facilities, coordinated parking management, and improved local and regional connections to bike and trail systems as well as pedestrian connections between neighborhoods and commercial centers, schools and parks. Promoting common and shared parking will support a "park once" strategy, enabling people to walk to uses within centers once they arrive at

Land Use/Transportation Integration: Design Principles for Accommodating Transit, Bicycle and Pedestrian Travel

The following design principles will govern implementation of the County's Policy for Land Use/Transportation Integration to meet state and federal requirements for accommodating transit and bicycle and pedestrian travel.

- **Serve all Users.** All land use and transportation improvements are planned, designed, constructed, operated and maintained to support safe and convenient access for all users, and increase mobility for walking, bicycling and transit use, wherever possible and appropriate, while promoting safe, efficient and accessible operations for all users.

- **Context Sensitivity.** The planning and implementation of transportation improvements will reflect and respond to the land use characteristics for the areas and communities served, as represented in this General Plan and in community plans, whether the area is residential, commercial, industrial, public or open space, or urban, suburban or rural, or a planned community. Planning for both public and private projects should include working with residents, merchants, property owners, and other stakeholders to ensure that a sense of place is maintained and the goals of the General Plan are met.

- **Street Network/Connectivity.** The goal of the General Plan is to have a transportation system that provides a connected network of facilities accommodating all modes of travel that is integrated with planned land use. Achieving this goal includes a variety of public and private improvement enabling new streets and sidewalks, trails and bike paths to connect to existing streets and sidewalks, trails and bike paths, enabling construct of bus stops and shelters, where appropriate and needed, identifying and filling sidewalk gaps, promoting walkability, and looking for opportunities to repurpose public and private rights-of-way to enhance connectivity for cyclists, pedestrians, and transit users, particularly to schools, parks, employment centers, and shopping districts.

them. Reduced parking may be approved in transit-served locations.

7. NEW DEVELOPMENT COMPATIBILITY

To require new development to be compatible with adjacent areas.

The purpose of the New Development Compatibility Policy is to ensure that new development is compatible with adjacent areas and the character of local streets and that it provides either a land use buffer or transition to reduce the effects of one land use on the other.

Sensitive treatment is required where one urban use transitions to another and where an urban use is introduced into an essentially undeveloped area.

New development within the Foothill-Trabuco Specific Plan planning area shall be designed to maintain a buffer between urban development and the Cleveland National Forest, to be compatible with the area, and to reflect the goals and objectives of that Plan.

Within airport planning areas, all new development will comply with Orange County Airport Environs Land Use Plan compatibility criteria.

8. CREATIVE DESIGN CONCEPTS

To encourage innovative concepts which contribute to the solution of land use problems.

The purpose of the Creative Design Concepts Policy is to encourage the use of innovative planning ideas that give variety to the character of development and solve certain site development, parking and site access problems. New design concepts can facilitate environmentally sensitive development, access by all modes of transit, coordinated parking management, and the economic and efficient provision of services and facilities. They can also reduce development costs and enhance property values.

9. ENHANCEMENT OF ENVIRONMENT

To guide development so that the quality of the physical environment is enhanced.

The purpose of the Enhancement of Environment Policy is to ensure that all land use activities seek to enhance the physical environment, including the air, water, sound levels, landscape, and plant and animal life.

This policy does not mean that environmental enhancement precludes development. It recognizes the need to improve both the manmade and natural environments. Where aspects of the natural environment are deemed to be truly significant, this policy requires measures be taken to preserve these aspects.

10. EMPLOYMENT DEVELOPMENT

To encourage development of employment land uses to achieve balanced phasing of development.

The purpose of the Employment Development Policy is to accelerate development of employment uses in unincorporated Orange County. The unincorporated County areas that are designated for employment uses have not developed as rapidly as its residential areas. Implementation of accelerated employment development is essential to achieving balanced land use and resolving the inefficient usage of the transportation system.

Annual Monitoring Reports (AMRs) identify the phasing of development and infrastructure needs in planned communities on an annual basis.

Development of employment land uses should continue to be monitored through the AMR process to determine if the employment to dwelling units ratio is improving.

11. CHILDCARE IMPROVEMENT

To encourage and facilitate provision of childcare facilities to address the growing County demand.

The purpose of the Childcare Improvement Policy is to develop measures that will encourage establishment of childcare facilities within Orange County. Due to changing demographic trends, there exists a countywide shortfall, in meeting childcare demand that is expected to increase significantly over the next decade.

In order to address this current shortfall, it is necessary to examine three components of childcare needs. Infant care refers to childcare for children 0-2 years old; Preschool care is primarily for children 2-5 years old; and Extended Day care is for school age children after and/or before normal school hours.

Provision of sites for the first two types of childcare should be encouraged in concentrated employment areas for ease of access for working parents (however,

some communities may have sufficient demand in residential areas for childcare sites); Extended Day care facilities are more appropriate near residential areas and school facilities.

Implementation of a Childcare Improvement Policy is essential to achieve a balance between supply and demand of the various types of childcare facilities.

12. HAZARDOUS WASTE MANAGEMENT FACILITIES

To protect the health and welfare of the public and quality of the environment, while preserving the economic vitality of Orange County through a comprehensive countywide program and to ensure the safe and efficient management of hazardous wastes.

The purpose is to provide for sufficient and appropriate treatment and transfer facilities to accommodate and manage Orange County's fair share of the hazardous waste management burden, in accordance with identified facility needs and public safety considerations and to encourage private sector development of needed hazardous waste management facilities.

Siting criteria for offsite hazardous waste facilities have been established for use by facility developers in locating suitable facility sites and designing appropriate facilities, and for use by city and county land use authorities and local communities in evaluating proposed sites and facility projects for local permits. These criteria are identified in the Regional Hazardous Waste Management Plan maintained by the County of Orange Health Care Agency, Environmental Health Division.

A summary of topics addressed by the siting criteria are as follows:

a) Protect the residents of Orange County
b) Ensure the structural stability of the facility
c) Protect surface and groundwater quality
d) Protect air quality
e) Protect environmentally sensitive areas
f) Ensure safe transportation of hazardous waste
g) Protect the social and economic goals of the community

13. RECYCLING/MATERIALS RECOVERY

To encourage and facilitate establishment of recycling/materials recovery facilities to address the State mandate given through the California Integrated Waste Management Act of 1989 (AB 939).

The purpose of the Recycling/Materials Recovery Policy is to develop measures that will help facilitate the establishment of recycling and materials

recovery facilities within Orange County. The California Integrated Waste Management Act of 1989 (AB 939) requires that local jurisdictions reduce their waste going to landfills by 25 percent by 1995 and 50 percent by the year 2000. AB 939 further mandates that each jurisdiction prepare a Source Reduction and Recycling Element (SRRE) in which specific program alternatives are identified, evaluated, and selected to achieve AB 939 diversion mandates.

The County's OC Waste and Recycling is charged with the development and implementation of the County's SRRE document and is responsible for compliance with its provisions. Procedures and guidelines are in place in the Orange County Zoning Code in order to facilitate establishment of recycling or materials recovery facilities within Orange County. Enhancing coordination between the County's OC Waste and Recycling and the California Integrated Waste Board Management (CIWMB) will continue to be a priority in order to address the mandate of AB 939.

14. URBAN AND STORM RUNOFF REGULATIONS

To guide physical development within the County while protecting water quality through required compliance with urban and stormwater runoff regulations.

The purpose of the policy is to address urban runoff and stormwater pollution associated with development and redevelopment activities. Protection and preservation of water resources in the United States is governed by the Federal Clean Water Act (CWA). Passage of the 1987 Water Quality Act established National Pollution Discharge Elimination System (NPDES) permit application requirements for municipal and industrial dischargers of stormwater. In California, the State Water Resources Control Board and nine associated Regional Water Quality Control Boards ensure compliance with the CWA under the auspices of the U.S. Environmental Protection Agency.

Since 1990, operators of municipal separate storm sewer systems (MS4s) are required to develop a stormwater management program designed to prevent harmful pollutants from impacting water resources via storm water runoff. As an MS4 operator, Orange County must obtain and implement NPDES permits from both the Santa Ana (SAR) and San Diego (SDR) Regional Water Quality Control Boards. OC Watersheds, a division with the OC Public Works Department, is lead on water quality compliance. The OC Planning-Community Development website (http://ocplanning.net) provides access to current stormwater management

requirements and programs.

The following policies establish a framework for managing urban and stormwater runoff in compliance with applicable regulations. Additional policies are also provided in the Resources Element.

Encourage, support and require all new development and redevelopment projects to identify opportunities for implementation of Low Impact Development (LID) principles in the early stages of the development planning process.

Promote, support, and require innovative site planning and development techniques that allow for implementation of LID principles while taking into consideration specific hydrology and geology conditions.

Encourage, support and require the use of LID as art of an overall strategy to mitigate stormwater impacts from new development and redevelopment projects consistent with current NPDES permit requirements.

Encourage and support, where applicable, the use of buffer zones to protect natural water bodies, including but not limited to, wetlands and riparian corridors. Where infeasible, require other measures to protect natural water bodies.

Identify and evaluate potential changes to land use development regulations to support and promote stormwater management techniques and ensure regulations do not inhibit compliance with current NPDES permit requirements.

15. AIRPORT LAND USE PLANS

To ensure consistency between proposed development and Airport Environs Land Use Plans (AELUPS) for Orange County airports.

1. Buildings and structures shall not penetrate Federal Aviation Regulation (FAR) Part 77 Imaginary Obstruction Surfaces for John Wayne Airport unless found consistent by the Airport Land Use Commission (ALUC). Additionally, in accordance with FAR Part 77, applicants proposing buildings or structures that penetrate the 100:1 Notification Surface shall file a Form 7460-1 Notice of Proposed Construction or Alteration with the Federal Aviation Administration (FAA). A copy of the FAA determination shall be submitted to ALUC and the applicant shall provide the County with FAA and ALUC responses.

2. Development projects that include structures higher than 200 feet above existing grade shall be submitted to the ALUC for review. In addition, projects that exceed a height of 200 feet above

existing grade shall file Form 7460-1 with the Federal Aviation Administration (FAA).

3. Applicants for County approval of a heliport or helistop shall provide evidence that the proposed heliport or helistop complies fully with State of California permit procedures and with any and all conditions of approval imposed by the Federal Aviation Administration (FAA), the Airport Land Use Commission for Orange County (ALUC), and by the Caltrans Division of Aeronautics.

LAND USE ELEMENT INTERPRETIVE POLICIES

1. TRANSITIONAL USE POLICY

Transitional uses that are not specifically permitted by LUE land use categories may still be deemed appropriate under certain circumstances and, therefore, may not require LUE amendments. The following are examples of circumstances under which transitional uses may be considered for specific sites:

a) Where a conflict exists between the LUE land use category and policies contained within other General Plan elements.

b) Where a conflict exists between the LUE land use category and a major LUE policy.

c) Where environmental conditions, such as high noise levels, traffic levels, or site configuration, render the site no longer suitable for the uses permitted by the LUE land use category.

2. LAND USE CATEGORY BOUNDARY INTERPRETATIONS

The LUE map shows boundaries that appear to follow topographic or manmade features. In certain instances these boundaries may require interpretation in order to respond to existing conditions. Boundary interpretation may be utilized as the basis for a LUE consistency determination for certain projects if both of the following conditions exist:

a) The proposed use would be compatible with and connected to, as appropriate, the uses identified in the LUE for the surrounding area.

b) No significant environmental, transportation or public service impacts will be created as a result of the boundary interpretation.

IMPLEMENTATION PROGRAMS

This section establishes eight land use programs that directly implement Land Use Element policies. These programs are

necessary to effectuate the intent and purpose of the LUE policies. Future development in the County will be reviewed for compliance with the LUE policies through the following programs.

1. GROWTH MANAGEMENT PROGRAM

Policy Mandate:

1) Phased Development Policy
2) Land Use/Transportation Integration Policy

Program Implementation Schedule:

On-going

Responsible Agency: OCPW/OC Development Services.

Discussion:

This program implements the Phased Development and Land Use/ Transportation Integration policies of the LUE through a requirement that developers of major projects submit annual reports projecting deficiencies in infrastructure and stating mitigation measures.

All major development proposals will be reviewed on the basis of the infrastructure analysis contained in their annual monitoring reports. Projects which would create infrastructure imbalances or deteriorate service capabilities will be recommended for modification or deferred until services are adequate.

Necessary Action:

None necessary at this time.

The County has instituted annual monitoring report (AMR) requirements for all major development projects and developed guidelines for their preparation and review. The projects subject to this requirement include:

- All developments presently required to submit an AMR as a condition of approval;
- All future LUE amendments;
- All major revisions to planned communities with more than 100 acres and/or 25 percent vacant land remaining;
- All zone changes and other applications for residential projects cumulatively larger than 100 units, or commercial/ employment projects of 100,000 square feet or more.

Projects for which the applicant has demonstrated a balance between public services and the proposed development, and for which conditions have been applied to ensure such balance, should be exempt from the requirement of an annual monitoring report.

Guidelines for the preparation and evaluation of these annual monitoring reports have been prepared by OCPW/OC Development Services. For a more detailed discussion of this

program see Appendix III-2.

2. HOUSING DENSITY BONUS PROGRAM

Policy Mandate: Housing Densities Policy.

Program Implementation Schedule: On-going program.

Responsible Agency: OCPW/OC Development Services.

Discussion:

The Density Bonus Program is an incentive provided to residential developers to facilitate housing affordable at all income levels. The purpose is to permit an increase in residential density in order to reduce development costs and thereby selling prices or rental rates. The program is tied to the Land Use Element since the computation of a bonus is based upon permitted density ranges.

Necessary Action:

No action is necessary at this time. On December 10, 2013, the Board of Supervisors adopted Ordinance 13-008, which established density bonus incentives intended to facilitate the production of affordable housing, senior citizen housing and child care facilities. The County's density bonus incentive program is consistent with State Density Bonus Law (Government Code Section 65915).

The density bonus program may be expanded to include developments that promote transit access, bikeability and walkability. Under SB 743, density bonuses may also be encouraged as a potential mitigation strategy. In particular, a density bonus shall be allowed if the project includes both residential and employment land uses, and if the project includes affordable housing.

3. INFILL AND TRANSIT-ORIENTED DEVELOPMENT

Policy Mandate: Infill and Transit-Oriented Development Policy.

Program Implementation Schedule: On-going program.

Responsible Agency: OCPW and OC Development Services.

Discussion:

The Infill and Transit-Oriented Development Program provides guidance at the corridor level to implement County policy with infill incentives tied to transit access and support for all modes of transportation. It may include the following initiatives:

- Establish zoning regulations and development standards for preferential parking for car pools/van pools, for shared or common parking, for bike parking, and for reduced parking in transit-

served areas.

- Investigate the feasibility of establishing minimum residential density standards along with reduced parking standards and mixed use development incentives in transit-served corridors to achieve General Plan goals.
- Offer incentives for preferential parking for car pools/van pools, for shared or common parking, for bike parking, for reduced parking in transit-served areas, for mixed use development in Transit Priority Areas, for qualifying infill development, as defined in State law, and for land dedication for transit facilities, bikeways or pedestrian ways.
- Fund public right of way safety improvements in infill areas for all modes to make these areas more attractive for development.
- Ensure compliance with the Americans with Disabilities Act (ADA) in pedestrian precincts and Transit Priority Areas for persons with disabilities.
- Establish a partnership program with local transportation agencies and transit operators to improve bus stops and shelters, particularly in unincorporated disadvantaged communities and in Transit Priority Areas.
- Establish a partnership program with local transportation agencies and local jurisdictions to refine and implement a countrywide bicycle/pedestrian circulation system, with priority given to investing in projects located in, or serving, Transit Priority Areas.
- Establish a partnership program with local transportation agencies and local jurisdictions to expand Active Transportation and Safe Routes to Schools programs, focusing particularly on those programs supporting infill and transit-oriented development.
- Under SB 743, projects within 0.5 mile (mi) of a Transit Priority Area (TPA) or an HQTA (High Quality Transit Area) are encouraged, since they may result in a less than significant impact to transportation and circulation, and thus may be screened out from VMT analysis.

Necessary Action:

Development of implementation documents, partnerships and funding.

4. COMMUNITY PLANNING

Policy Mandate: New Development Compatibility Policy.

Program Implementation Schedule:

On-going program.

Responsible Agency: OCPW/OC Development Services

Discussion:

The Community Planning Program provides guidance at the community

level that formalizes County policy uniquely appropriate to certain areas through the preparation of specific plans, redevelopment plans, rehabilitation plans, local coastal plans, planned community zoning, neighborhood plans, partnerships for Active Transportation and Safe Routes to Schools programs, parking management plans and provisions for reduced parking in transit-served areas and infill incentive priorities tied to transit access and support for all modes.

Necessary Action:
None is necessary at this time. Community Planning is an existing OCPW/OC Development Services function.

5. ENVIRONMENTAL REVIEW PROCESS

Policy Mandate: Enhancement of the Environment Policy.

Program Implementation Schedule:
On-going program.

Responsible Agency: OCPW/OC Development Services

Discussion:
This program minimizes environmental impacts of development through the County's environmental review procedure. This program implements state and federal environmental protection laws in Orange County.

Necessary Action:
Technical amendments related to transportation impact analysis and streamlining opportunities. Environmental review is an existing OCPW/OC Development Services function. In 2013, California Environmental Quality Act (CEQA) was amended through SB 743 to provide an alternative to Level Of Service (LOS) for evaluating transportation impacts. In the past, LOS standards discouraged infill development and construction of infrastructure for transit, cycling, and walking, as these typically increase population and potential traffic in a given area. Alternative criteria to measure impacts include vehicle miles traveled (VMT), automobile trips generated or other similar performance measures. ~~SB 743 does not prevent a city or county from continuing to analyze LOS as part of its consistency analysis with general plans or other planning requirements, but these~~ Statewide implementation for SB 743 began July 1, 2020, and the County of Orange will utilize its own guidelines to assist applicants and County agencies with the evaluation of projects within unincorporated Orange County. The County continues to apply the Level of Service (LOS) analysis or other traditional metrics to determine traffic impacts for operational level assessment as

appropriate; however, these LOS metrics may no longer constitute the sole basis for determining transportation impacts under CEQA for projects within Transit Priority Areas (TPAs). In addition, the County will seek to implement a streamlined CEQA process in TPAs consistent with the streamlined CEQA process available to cities. CEQA streamlining can provide time certainty, cost and benefits needed by infill and transit-oriented development. Eligible projects must contain at least 50 percent of residential use, have a minimum net density of 20 units per acre, and be located within half a mile of a major transit stop of high-quality transit corridor.

6. NATURAL COMMUNITIES CONSERVATION PLANNING PROGRAM (NCCP)

Policy Mandate: Enhancement of the Environment Policy.

Program Implementation Schedule:
On-going Program
Responsible Agency: OCPW/OC Development Services.

Discussion:
The NCCP established a 38,000-acre habitat reserve system (Central-Coastal Sub-region) for native habitats found in Orange County, including coastal sage scrub, chaparral, grassland, riparian, woodland, and forest. The focus of the Program is to protect "target" species: the California gnatcatcher, coastal cactus wren and orange-throated whiptail lizard. Work continues on development of a habitat reserve system for the County's Southern Sub-region.

Necessary Action:
None is necessary at this time. NCCP is an existing OCPW/OC Development Services responsibility.

7. ANNUAL LAND USE ELEMENT REVIEW

Policy Mandate:
Creative Design Concepts Policy; Employment Centers/Transportation Access Policy.

Program Implementation Schedule:
On-going program.

Responsible Agency: OCPW/OC Development Services

Discussion:
This program provides a review of the policies, land use categories, and programs of the Land Use Element on an annual basis to make modifications in light of the previous year's experience and to facilitate innovative planning concepts.

Necessary Action:
Identify minor or major changes to the Land Use Element that will rectify inequities, clarify ambiguities, speed processing and otherwise refine and

improve the element on an annual basis.

Review areas subject to flooding to ensure consistency between flood-related maps in the Land Use Element and current FEMA and DWR flood maps. Revisions to flood-related maps in the Land Use Element will be completed as necessary.

8. CHILDCARE IMPROVEMENT PROGRAM

Policy Mandate: Childcare Improvement Policy.

Program Implementation Schedule:
On-going, upon adoption of Childcare Improvement Policy.

Responsible Agency: OCPW/OC Development Services

Discussion:
The purpose of this program is to ensure that childcare facilities are accommodated in areas of greatest need. In order to adequately address childcare needs, it is necessary to examine three components of childcare.

Infant care refers to childcare for children 0-2 years old; Preschool care is primarily for children 2-5 years old; and Extended Day Care is for school age children after and/or before normal school hours.

Provision of sites for the first two types of childcare should be encouraged in concentrated employment areas for ease of access for working parents (however, some communities may have sufficient demand in residential areas); Extended Day Care facilities are more appropriate near residential areas and school facilities.

This program also provides coordination between the County and school districts and/or private agencies that provide childcare services. School district/private agency services include before and after school programs located at local schools.

Necessary Action:
New developments will participate in the Childcare Improvement Program through conditions placed on projects in the unincorporated South County area. Appropriate coordination will also be encouraged between the County, school districts, community programs, and developers.

9. RECYCLING/MATERIALS RECOVERY PROGRAM

Policy Mandate:
Recycling/Materials Recovery Policy

Program Implementation Schedule:
On going, upon adoption of Recycling/Materials Recovery Policy

Responsible Agency:

- OC Waste and Recycling
- OCPW/OC Development Services

Discussion:

The purpose of this program is to ensure that recycling and/or materials recovery facilities are accommodated in areas of greatest need.

OC Waste and Recycling is charged with the preparation and implementation of a Source Reduction and Recycling Element (SRRE) in which specific program alternatives are identified, evaluated, and selected to achieve AB 939 diversion mandates.

One option that is being facilitated through the County's discretionary permit process involves the next generation of technologies, the Materials Recovery Facility (MRF). A "MRF" is a central solid waste facility where waste materials, either source separated or mixed, are sorted and processed for sale to end users. OCPW/OC Development Services, upon submittal of new requests, is charged with the review, analysis, and processing proposed recycling or materials recovery facilities.

Areas in which these uses would be most appropriate are urban activity centers, employment areas, lands designated for public facilities, solid waste facility districts, and open space areas (when such development would be consistent with the open space character).

Necessary Action:

New development requests for recycling/materials recovery facilities will be reviewed and processed by OCPW/OC Development Services.

Appropriate coordination will be encouraged between the County, applicant, community, and appropriate State agencies.

Attachment 5

IV. TRANSPORTATION ELEMENT

CA/KB

OVERVIEW

The Transportation Element, one of the nine elements of the Orange County General Plan contains County policies on the development of transportation facilities necessary to accommodate the County's orderly growth. The Transportation Element identifies goals, objectives, policies, and implementation programs that affect the transportation system and provide guidance for future transportation planning efforts within the unincorporated areas.

The Transportation Element contains three components:

- Circulation Plan
- Bikeways Plan
- Scenic Highways Plan

All three components are closely related and play a vital role in the County's efforts to achieve a balanced transportation system through integration of multi-modal transportation facilities.

Each component identifies and briefly describes transportation goals, objectives, policies, and implementation program that provide direction for transportation planning

within the unincorporated territory of the County.

PURPOSE OF THE ELEMENT

The Transportation Element sets forth a comprehensive strategy for planning, developing, and maintaining a surface transportation system to serve existing and planned land uses in the unincorporated areas of Orange County. The primary goal, consistent with the State mandate, was originally adopted by the Orange County Board of Supervisors on May 10, 1972. On June 9, 1982, this goal was reaffirmed as follows:

> *To develop an integrated transportation system consisting of a blend of transportation modes capable of meeting the need to move people and goods by private and public means with maximum efficiency, convenience, economy, safety, and comfort and a system that is consistent with other goals and values of the County and the region.*

RELATIONSHIP TO OTHER ELEMENTS

The Transportation Element has the same horizon year and growth assumptions as other elements so as to ensure internal consistency.

The Transportation Element is one part of a compendium of nine General Plan elements that address projections for the next 20 to 30 year time frame. The Transportation Element provides a basis for transportation-related decisions, and complements the other General Plan elements. Specifically, it clarifies and addresses transportation issues raised in the other General Plan elements and offers guidance toward solutions.

The Transportation Element, as an expression of County transportation policy, achieves consistency with other General Plan elements through the use of common demographic assumptions. These demographic projections have been adopted by the Board of Supervisors in the Orange County Projections (OCP) 2000, a single data reference used for County policy-making and planning. All long-range planning and budgeting activities by the County of Orange and the Orange County Transportation Authority (OCTA) are based on these projections.

This Element is also responsive to the Growth Management Plan Element policies, Air Quality Management District (AQMD) objectives, and regional planning objectives of the Southern California Association of Governments (SCAG) and the OCTA.

COMPONENT ONE: CIRCULATION PLAN

Overview

The Circulation Plan Component establishes a system of surface roadways within the unincorporated areas of the County. This system is depicted on the Circulation Plan (Figure IV-1) and is a key factor in the definition of the County's transportation policy. The County's goal is to coordinate with the cities and OCTA as the regional transportation planning agency (RTPA) to develop a consistent intra-community arterial highway system that will effectively serve existing and future land uses within its jurisdiction.

Background

The Circulation Plan (previously inclusive in the Master Plan of Arterial Highways) was first adopted by the County in 1956. It was the cornerstone of the first County Circulation Plan initially adopted on August 6, 1974, by the Board of Supervisors (Resolution No. 74-1151), and was subsequently amended in December 1978 (Resolution No. 78-1824).

The Circulation Plan is amended on a regular basis, generally in response to land use policy changes in the unincorporated areas of the County. These policy changes are reviewed for impacts on the arterial highway system in order to maintain a balance between the land use and transportation plans.

The Circulation Plan map depicts a network of major thoroughfares comprising freeways, transportation corridors, and five main arterial highway classifications: principal, major, primary, secondary, and commuter. In addition, one other arterial highway sub-category (Smartstreets) is identified in this Element.

The principal, major and primary arterial classifications and Smartstreets predominantly serve regional travel. Secondary and commuter arterial highways function as collectors funneling traffic from local streets to primary, major, and principal

arterials. The overall network of thoroughfares is designed to accommodate existing and projected traffic.

The Circulation Plan classifications are a statement of policy intended to reserve adequate right-of-way for future highway improvements within the unincorporated areas of the County. Design guidelines and criteria are briefly described for each arterial classification.

Purpose

The Circulation Plan serves as the legally required Circulation Element for the unincorporated areas under California Government Code Section 65302(b), and is one of the three components of the Transportation Element of Orange County's General Plan.

The main purpose of the Circulation Plan is to describe an arterial highway system that effectively supports General Plan policies and serves existing and adopted future land uses in the unincorporated areas of Orange County. Extensive coordination with the land use planning and implementation processes carried on by the County of Orange and adjacent jurisdictions is essential for the Circulation Plan to provide its intended service to County motorists.

CLASSIFICATION

Arterial highways are shown on the Circulation Plan map in the following two forms:

1) Established alignments depicted by solid lines on the map, including existing highways where the centerline is the precise centerline, and future highways where the Board of Supervisors, a City Council, or the subdivision process has established a precise alignment; and

2) Conceptually proposed alignments, defined by intermittent lines indicating future facilities whose precise alignment and category have not yet been determined.

Arterial highways have been divided into classifications to address travel demand needs in terms of capacity and number of through lanes to aid in setting consistent design standards for unincorporated territory. These and other classifications are contained in the County's Highway Design Manual. These standards are used to ensure that arterial highway facilities are designed with public safety and adequate carrying capacity in mind. In addition, special intersection approaches for principal, major, primary, and secondary arterials have been identified to help address congestion problems.

A concept of the "Maximum Feasible Intersection" (MFI) has been introduced to establish a guideline for intersection enhancement that is compatible with travel

Insert Figure IV-1 (Circulation Plan Map)

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demand requirements and operation capabilities of the highway system. Traffic studies, for example, can also be used as a mechanism to identify intersections that may require enhancement above the standard plan specified for that facility. Therefore, notwithstanding typical intersection geometrics as identified in the County Highway Design Manual, additional right-of-way may be required to implement the MFI. The MFI for each classification is defined in the classification description.

Transportation Corridor

A transportation corridor is a multi-modal facility of six to ten lanes, depending on projected traffic volumes, with a median of sufficient width to accommodate future options such as fixed rail or high occupancy vehicles. The corridors provide for efficient movement of vehicular traffic where projected volumes exceed major arterial highway capacities. These routes have been designed to Caltrans freeway and expressway standards and have been incorporated into that system.

As of 1999, the San Joaquin Hills (SR-73) and Eastern (SR-133, the northern segments of SR-241, and SR-261) Transportation Corridors have been completed. In addition, the Foothill Transportation Corridor (SR-241) between SR-133 and Oso Parkway is complete. The southern portion of the Foothill Transportation Corridor south of Oso Parkway is scheduled for completion in 2008.

These corridors are approved in the Surface Transportation and Uniform Relocation Assistance Act passed by Congress in 1987 as Federal toll road pilot projects. Additionally, these new corridors are authorized by State legislation as the State's first toll roads and will remain as pilot "toll" facilities until the bonding is paid. These corridors are to be operated by demand management to ensure a high level of operation, and tolls will be the implementation mechanism to maintain free

flow.

Final alignment and environmental studies will define the ultimate route of the proposed southern portion of the Foothill Corridor. These studies will identify the necessary rights-of-way based on projected traffic volumes and the various transportation modes to be accommodated.

Principal Arterial

A principal arterial is an eight-lane divided roadway, with a typical right-of-way width of 144 feet and a roadway width of 126 feet, curb to curb, including a 14-foot median (Figure IV-2). A principal arterial is designed to accommodate approximately ~~45~~ 40,000 to 60,000 vehicle trips per day at Level of Service 'C'.

Maximum Feasible Intersection (MFI)

The standard MFI for a principal arterial shall consist of four through lanes, two left-turn lanes and a free right-turn lane. An optional right-turn lane, in lieu of a free right, may be allowed if warranted by traffic demand. Alternative geometrics, such as a grade separation or other special treatment, may be considered if they are cost effective and operationally feasible. In review and approval of subdivisions, the objective shall be to reserve adequate right-of-way to permit future implementation of the MFI as warranted.

Major Arterial

A major arterial highway is a six-lane divided roadway, with a typical right-of-way width of 120 feet~~,~~ and a roadway width from curb to curb, including a 14 foot median, of 102 feet (Figure IV-3). A major is designed to accommodate approximately 30,000 to 45,000 vehicle trips per day at Level of Service 'C'. Major arterials carry a large volume of regional through traffic not handled by the freeway system.

MFI

The standard MFI for a major arterial shall consist of three through lanes, two left turn lanes and a free right turn lane. An optional right-turn lane, in lieu of a free right, may be allowed if warranted by traffic demand. Alternative geometrics such as a grade separation or other special treatment may be considered if they are cost effective and operationally feasible. In review and approval of subdivisions, the objective shall be to reserve adequate right-of-way to permit future implementation of the MFI as warranted.

Primary Arterial

A primary arterial highway is a four lane divided roadway, with a typical right-of-way width of 100 feet and a roadway width from curb to curb, including a 14 foot median, of

PRINCIPAL - 144'

(8 LANES DIVIDED)

Figure IV-2

MAJOR - 120'

(6 LANES, DIVIDED)

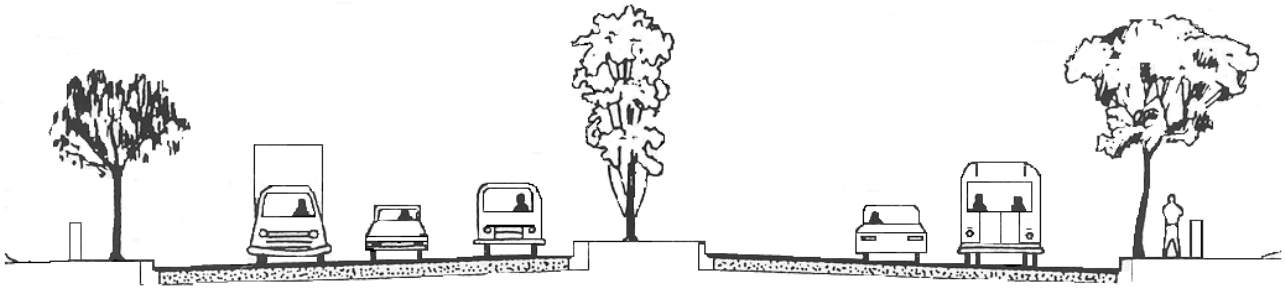

Figure IV-3

84 feet (Figure IV-4). A primary is designed to accommodate approximately 20,000 to 30,000 vehicle trips per day at Level of Service 'C'. A primary arterial's function is similar to that of a major arterial. The principal difference is capacity.

MFI

The standard MFI for a primary arterial shall consist of two through lanes, two left turn lanes and a free right turn lane. An optional right turn lane, in lieu of a free right, may be allowed if warranted by traffic demand. Alternative geometrics such as a grade separation or other special treatment may be considered if they are cost effective and operationally feasible. In review and approval of subdivisions, the objective shall be to reserve adequate right-of-way to permit future implementation of the MFI as warranted.

Secondary Arterial

A secondary arterial highway is a four-lane undivided (no median) roadway, with a typical right-of-way width of 80 feet, and a roadway width from curb to curb of 64 feet (Figure IV-5). A secondary arterial is designed to accommodate approximately 10,000 to 20,000 vehicle trips per day at Level of Service 'C'. A secondary arterial serves as a collector, distributing traffic between local streets and principal, major and primary arterials. Although some secondary arterials serve as through routes, most provide more direct access to surrounding land uses than principal, major or primary arterials.

MFI

The standard MFI for a secondary arterial shall consist of two through lanes, one left turn lane and a free right turn lane. An optional right turn lane, in lieu of a free right, may be allowed if warranted by traffic demand. Alternative geometrics such as a grade separation or other special treatment may be considered if they are cost effective and operationally feasible. In review and approval of subdivisions, the objective shall be to reserve adequate right-of-way to permit future implementation of the MFI as warranted.

Collector Arterial

A collector arterial highway is a two-lane undivided, unrestricted access roadway, with a typical right-of-way width of 56 feet and a roadway width from curb to curb of 40 feet (Figure IV-6). A collector is provided to accommodate up to approximately 10,000 vehicle trips per day at Level of Service 'C'. By strict definition, a collector facility is not an arterial highway. It functions primarily as a commuter facility. It differs from a local collector street in its ability to handle through traffic movements between two arterials. It is shown on the Circulation Plan because it provides network continuity, or may serve through traffic demand where projected volumes do not warrant a secondary.

PRIMARY – 100’

(4 LANES, DIVIDED)

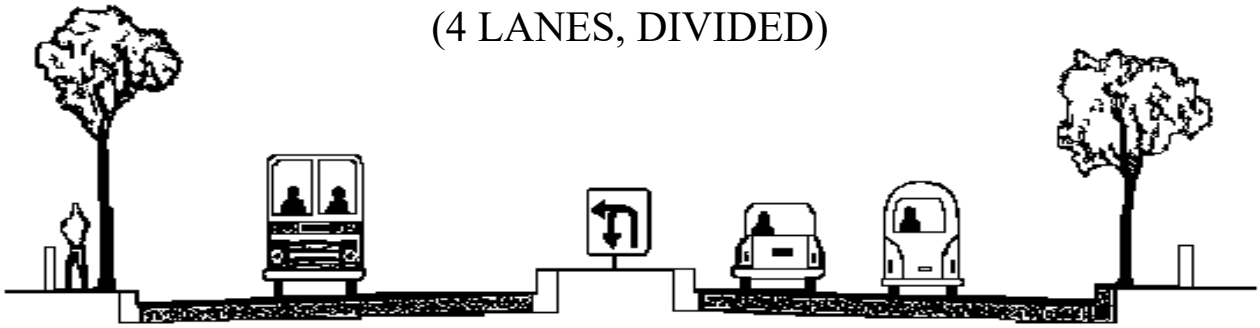

Figure IV-4

SECONDARY – 80’

(4 LANES, UNDIVIDED)

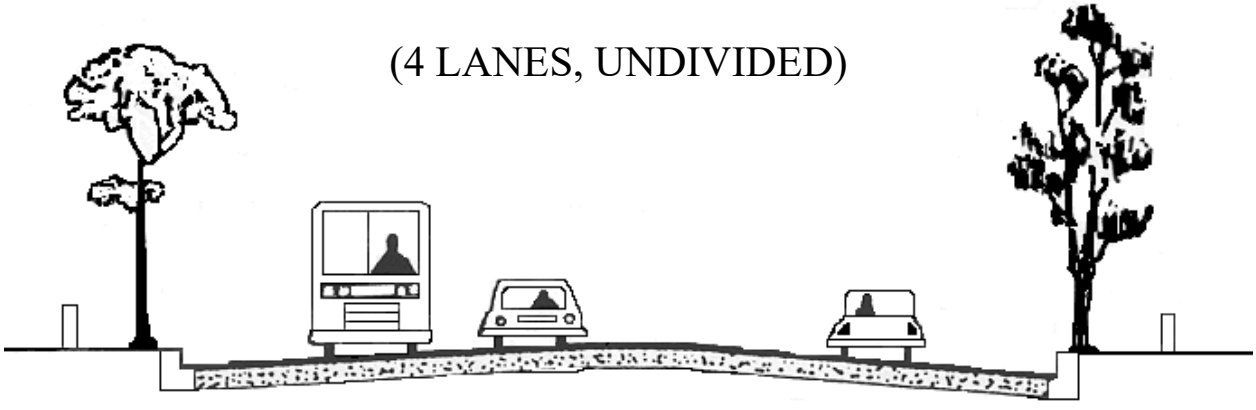

Figure IV-5

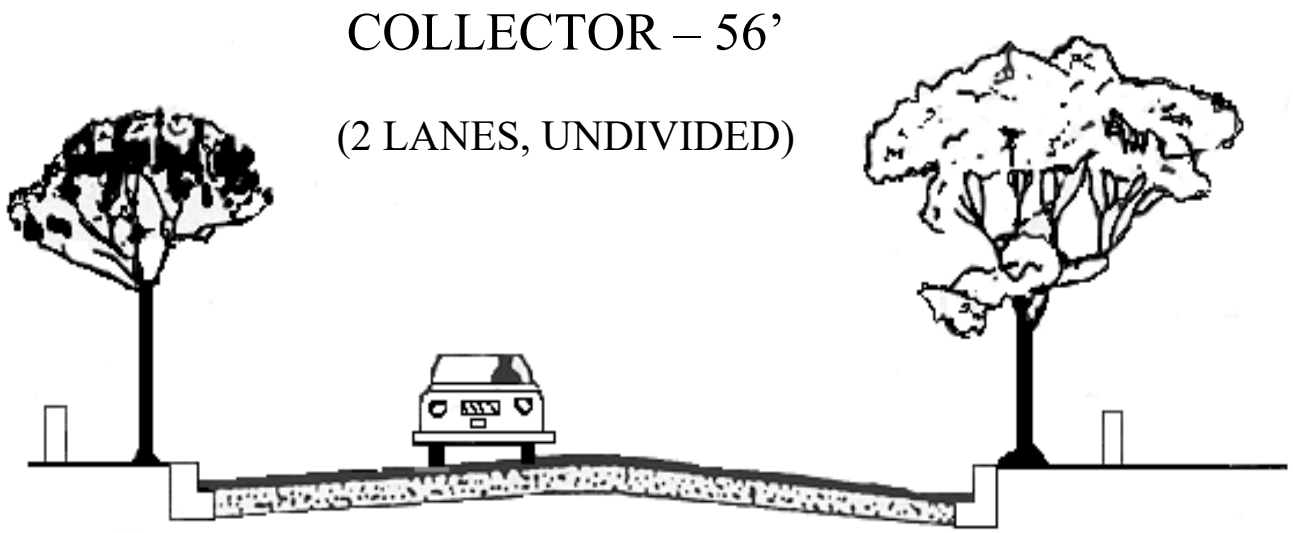

Figure IV-6

Smartstreet

In addition to the arterial classifications, the Circulation Plan recognizes Smartstreet arterials with an enhanced traffic-carrying capacity. The augmentation in capacity may be achieved by a variety of measures:

- Addition of through or turn lanes at intersections;
- Preferential traffic signal timing and synchronization;
- Removal of on-street parking;
- Intersection grade separations;
- Grade separated turning movements;
- Access limitation - right turns only, or no access (streets and/or driveways);
- Access consolidation;
- Frontage roads;
- Pedestrian grade separations; and
- Other elements which may be found useful.

The intent of these measures is to minimize conflicts with cross traffic. These measures improve traffic carrying capacity and facilitate improved traffic flow along an arterial. Hence, the terms "High Flow Arterial" or "Continuous Flow Boulevard" can also be used to describe a “Smartstreet.” This designation is intended to represent a roadway of a major or a principal arterial classification.

Intersection Condition

Intersection performance is the most critical factor in determining traffic conditions on arterials. Intersection condition should be considered in the planning process to improve traffic flow conditions in the arterial highway system.

Reclassification

A reduction in classification of a roadway from one side of an intersection to the other is made by transitioning the higher classification to the lower classification over a specified section beyond the intersection. Specifications for the required transition length are contained in the CALTRANS Traffic Manual (current edition).

Other Considerations

The typical sections depicted in the Circulation Plan legend, and in Figures IV-2 through IV-6, are simplified diagrams based upon adopted Orange County Standard Plans. Notwithstanding these arterial highway specifications, additional right-of-way may be required for any classification when an arterial highway coincides with an adopted route for an additional public facility (e.g., transit facilities, bikeways, or riding and hiking trails) or a scenic highway. The "right-of-way reserve" designation on the Circulation Plan indicates that origin-destination needs have been projected in the area, but ultimate carrying capacity requirements have not been determined. This status is applied to facilities where the classification is uncertain due to potentially significant land use changes or network continuity needs.

A route designated "right-of-way reserve" requires design and right-of-way sufficient to construct a major arterial highway. Any refinements to the underlying classification would occur in conjunction with the land use planning process. The "right-of-way reserve" designation allows right-of-way flexibility to meet potential changes in the Land Use Element.

GOALS, OBJECTIVES AND POLICIES: *Circulation Plan*

Goals, objectives and policies are intended to provide direction for transportation implementation in the County's unincorporated areas.

A goal is a general expression of values and is abstract in nature. Goals look to an ultimate future of approximately twenty years. An objective is an intermediate step toward attaining a goal and is relatively more specific. A policy is a specific statement that guides decision-making.

Goal 1

Provide a circulation plan that supports land use policies of the County.

- ***Objectives***

  1.1 Establish a circulation plan that accommodates the General Plan Land Use Element of the County.

  1.2 Establish a circulation plan designed to serve as part of a balanced transportation system (auto, rail, transit, bus, truck, bicycle, pedestrian, etc.).

1.3 Develop a program to monitor arterial highway conditions at intersections within the unincorporated areas to ensure that an acceptable Level of Service (LOS) is maintained.

1.4 Prepare circulation monitoring reports to evaluate the cumulative impacts of major land use developments within unincorporated County areas.

1.5 Develop a circulation phasing plan to ensure that adequate roadway capacity is available on the circulation network to accommodate increments of new development.

1.6 Develop a "7 Year Capital Improvement Program" of circulation improvements pursuant to Measure M and the Congestion Management Program (CMP).

- ***Policies***

1.1 Implement the circulation plan in a manner that supports the implementation of adopted overall land use policies and which is consistent with financing capabilities.

1.2 Apply conditions to land use development projects to ensure that the direct and cumulative impacts of these projects are mitigated consistent with established level of service policies.

Goal 2

Provide a circulation (arterial highway) plan that is integrated with that of adjacent jurisdictions.

- ***Objectives***

2.1 Plan, develop and implement a circulation system in the unincorporated areas, which is consistent with the Master Plan of Arterial Highways and circulation plans of adjacent jurisdictions.

- ***Policies***

2.1 Coordinate with the following transportation planning agencies: Caltrans (State), Orange County Transportation Authority (OCTA), the Transportation Corridor Agencies (County corridor planning and construction) and Orange County cities on various studies relating to freeway, tollway and transportation corridor planning, construction, and improvement in order to facilitate the planning and implementation of an integrated circulation system.

~~2.2 Support the implementation and development of the south leg of~~

~~the Foothill Transportation Corridor (FTC) as viable means of improving traffic circulation within Orange County.~~

2.2~~3~~ Coordinate Circulation Plan planning with OCTA for the purpose of promoting existing and future transit system programs.

2.3~~4~~ Apply conditions to development projects to ensure compliance with OCTA's transit goals and policies.

2.4~~5~~ Apply conditions to development projects to ensure implementation of the Circulation Plan as applicable.

Goal 3

Provide a circulation plan that facilitates the safe, convenient and efficient movement of people and goods throughout unincorporated areas of the County.

- ***Objectives***

  3.1 Establish minimum roadway specifications necessary to ensure safe and efficient movement of vehicles and other modes of transportation.

  3.2 Provide for safe and efficient movement of traffic on smartstreets, 8-lane, 6-lane, 4-lane and 2-lane arterials so as to provide access to the regional circulation network.

- ***Policies***

  3.1 Maintain acceptable levels of service on arterial highways pursuant to the Growth Management Element of the General Plan.

  3.2 Ensure that all intersections within the unincorporated portion of Orange County maintain a peak hour level of service "D", according to the County Growth Management Plan Transportation Implementation Manual.

  3.3 Evaluate all proposed land use phasing plans for major development projects to ensure maintenance of acceptable Levels of Service on arterial highway links and intersections.

Goal 4

Ensure that the circulation plan conforms to applicable environmental quality standards.

- ***Objectives***

  4.1 Ensure that development of the circulation plan is sensitive to the environmental character of communities and neighborhoods throughout the unincorporated areas of the County.

  4.2 Plan and develop, through design and alignment studies, roads in a

manner which minimizes impacts associated with crossing of flood plains or drainage courses; known earthquake fault zones, wildlife, unique geological, and resource conservation and open space areas and currently designated agricultural areas.

4.3 Maintain a circulation system that is compatible with the physical environment, to the extent practical, and allows for the preservation of the natural resources of the County.

- ***Policies***

4.1 Implement the Circulation Plan in a manner consistent with Federal, State and local environmental quality standards and regulations.

Goal 5

Manage peak hour traffic congestion to achieve an acceptable level of service (LOS) on existing and future circulation plan facilities in the unincorporated areas of the County.

- ***Objectives***

5.1 Implement the circulation system in a manner which achieves the established Traffic Level of Service Policy pursuant to the applicable Growth Management Plan (GMP) Element. The 2020 Updated Transportation Implementation Manual contains traffic LOS policies applicable to County unincorporated areas.

5.2 Develop traffic forecasts for County unincorporated areas that are consistent with those of OCTA.

5.3 Reduce Vehicle Miles Traveled in an effort to reduce greenhouse gas (GHG), pursuant to SB 743.

See "Guidelines for Evaluating Vehicle Miles Traveled Under CEQA" and "2020 Updated Transportation Implementation Manual".

- ***Policies***

5.1 Establish "traffic impact fees" for application to county development projects with measurable traffic impacts, as defined in the Growth Management Plan Element of the General Plan. These fees may serve as local matching funds for Orange County Measure 'M', state and federal highway funding programs.

5.2 Use uniform analytical methods, in conformance with the Growth Management Plan, Measure M, and the Congestion Management Program (CMP), to aid in transportation planning and impact evaluation and support the development and utilization of sub-area models to address detailed transportation issues.

5.3 Use adopted Orange County forecasts for all projections of future year population, housing, employment, and other socioeconomic data to assure consistency among other General Plan Elements.

5.4 Develop traffic forecasts for County unincorporated areas utilizing the approved Orange County forecast.

5.5 Require as conditions of approval that the necessary improvements to arterial highway facilities, to which a project contributes measurable traffic, be constructed and completed within a specified time period or ADT/peak hour milestone to attain a Level of Service "D" at the intersections under the sole control of the County. LOS 'C' shall be maintained on Santiago Canyon Road links until such time as uninterrupted segments of the roadway (i.e., no major intersections) are reduced to less than three miles. For a detailed discussion of LOS policies, refer to the 2020 Updated Transportation Implementation Manual.

5.6 Establish comprehensive traffic improvement programs to ensure that circulation improvements are built, as a condition of approval, to accommodate each phase of development. For a more detailed discussion regarding traffic improvement programs, refer to the Growth Management Plan Element of the General Plan.

5.7 Require, as a condition of approval, that a development

mitigation program, development agreement or developer fee program be adopted to ensure that development is paying its fair share of the costs associated with that development pursuant to Policy 5.1.

5.8 Participate in Growth Management Program (GMP) forums to develop and secure funding to implement circulation improvements necessary to achieve established LOS standards.

Goal 6

Implement transportation demand management (TDM) and transportation systems management (TSM) strategies which reduce peak hour vehicle travel demand and minimize single-occupant vehicles and trip length on the unincorporated County roadway system.

- ***Objectives***

6.1 Develop and promote a transportation system and strategies that are consistent with Rule 2202 of the South Coast Air Quality Management District (SCAQMD) and the County Transportation Demand Management (TDM) Ordinance (Ordinance No. 3820).

6.2 Encourage development of Park and Ride facilities in County unincorporated areas to integrate multi-modal transportation facilities and promote ridesharing. These activities should be done in coordination with OCTA and the development community.

6.3 Maximize the efficient movement of traffic through congested areas by using approved Orange County signal coordination methods.

6.4 Implement arterial highway intersections to their Maximum Feasible Intersection (MFI) capabilities when LOS deficiencies are noted.

6.5 Enhance the efficient movement of vehicles through the circulation system by providing bike lanes and restricting parking on arterials whenever feasible.

6.6 Enhance the continuous movement of vehicles along bus routes by providing bus turnouts.

6.7 Require developers of more than 100 dwelling units, or 25,000 square feet of non-residential uses to: a) demonstrate consistency between the local transportation facilities, services, and programs, and the regional transportation plan[1]; and b) submit, as part of their

[1] Current regional transportation plan ~~is that~~ that is developed by SCAG.

development proposal (non-residential), a Transportation System Management/ Transportation Demand Management (TSM/TDM) plan which includes strategies, implementation programs and an annual monitoring mechanism to ensure a reduction of single-occupant automobile travel associated with development.

- ***Policies***

6.1 Apply conditions to development projects to ensure compliance with applicable TDM/TSM regulations and the County's TDM Ordinance.

6.2 Encourage new developments to support means of enhanced pedestrian and bikeway use by providing linkages between land uses such as residential areas, parks, schools, businesses and commercial areas which typically generate a large number of peak hour trips.

6.3 Work with adjacent jurisdictions to cooperatively implement needed measures that would provide high occupancy vehicle lanes, emergency lanes or additional travel lanes, necessary channelization, and/or bicycle lanes whenever warranted and feasible.

6.4 Assist businesses in County unincorporated areas in the implementation of the policies of the County Transportation Demand Management (TDM) Ordinance.

6.5 Require employment centers (e.g. shopping malls, business parks, etc) with total employment of more than 100 to form Transportation Management Associations (TMA), or to be affiliated with an established TMA, to coordinate ridesharing for the purpose of reducing single-occupant vehicle trips to their site.

6.6 Encourage commercial developments to provide park and ride lots if practical and feasible.

IMPLEMENTATION PROGRAMS: *Circulation Plan*

Implementation programs provide a means of achieving General Plan Transportation Element goals, objectives and policies. The implementation programs have been adopted to assist in implementing the County Circulation Plan.

1. SUBDIVISION CONDITIONS OF APPROVAL

Subdivision map applicants are required to comply with certain conditions prior to approval of their

maps. Generally, standard conditions of approval, from the OC Public Works manual of "Standard Conditions of Approval", are applied to projects to ensure that developments meet county standards and that project impacts are mitigated. The intent of these conditions is to standardize and facilitate the application of requirements to development projects. Additional non-standard conditions should be applied to developments when appropriate.

2. ASSESSMENT DISTRICT

Assessment Districts are a means of financing the design and construction, through bond sales, of infrastructure needed to support new development. Periodic assessments, paid by property owners within the infrastructure area of benefit, are used to repay the bonds. Assessment Districts are administered by the County.

3. MAJOR THOROUGHFARE AND BRIDGE FEE PROGRAMS

There are ten major thoroughfare and bridge fee programs which include the following:

a) Foothill Circulation Phasing Plan (FCPP)

The FCPP was adopted by the Board of Supervisors on October 14, 1987 and is administered by OC Public Works (OCPW). As of July 1, 1995 approximately 98 percent of the roadways planned for FCPP funding were completed and 2 percent were in the final design and right of way acquisition phase based on lane-miles of roadway.

b) Coastal Area Road Improvements and Traffic Signals (CARITS)

The CARITS is a financing plan for the construction and improvement of roadways and intersections in the south county coastal area. It includes construction of 13 roadway sections (31 lane-miles), improvements to 6 intersections and installation of traffic signals at 29 locations. CARITS was adopted by the Board of Supervisors on December 14, 1988 and is administered by OCPW.

c) El Toro Road Fee Program

The El Toro Road Fee Program was adopted in October 1983 and is administered by OCPW. This financing program is for upgrading El Toro Road between Trabuco Road and Live Oak Canyon Road to its 1982 Master Plan of Arterial Highways designation as a primary arterial.

d) Moulton Parkway/Laguna Niguel Fee Program

The Moulton Parkway/Laguna Niguel Fee Program was adopted by the Board of Supervisors on January 7, 1987 and is administered

by OCPW. The program has constructed arterial highway improvements in the Laguna Hills, and Laguna Niguel and unincorporated areas.

e) Plano Trabuco Area Road Fee Program

The Plano Trabuco Area Road Fee Program was adopted in October 1983 by the Board of Supervisors and is administered by OCPW. The fee program was established to provide funding for the extension of Alicia Parkway and Santa Margarita Parkway across Trabuco Creek to Plano Trabuco Road, and an expansion of the Santa Margarita Parkway bridge over Trabuco Creek.

f) Santiago Canyon Road Fee Program

The Santiago Canyon Road Fee Program was adopted by the Board of Supervisors on August 10, 1990 and is administered by OCPW. The fee program was established to provide funds for widening Santiago Canyon Road to a primary arterial highway from Chapman Avenue to Live Oak Canyon Road.

g) Avenida La Pata Supplementary Road Fee Program

The Avenida La Pata Supplementary Road Fee Program was adopted by the Board of Supervisors on November 12, 1991 and is administered by OCPW. The purpose of the fee program is to construct Avenida La Pata from Ortega Highway to the City of San Clemente city limits.

h) San Clemente Regional Circulation Financing and Phasing Program (RCFPP)

The RCFPP was adopted by the City of San Clemente and subsequently by the Board of Supervisors on November 12, 1991. Administration of the program is by the city (for incorporated areas covered by the RCFPP) in coordination with OCPW (for unincorporated RCFPP areas). The program is a condition of approval for the Rolling Hills and Talega Valley Planned Communities and provides a mechanism for a phased program, tied to traffic level of service (LOS) and development, to construct arterial highway and I-5 interchange improvements.

4. ORANGE COUNTY COMBINED TRANSPORTATION FUNDING PROGRAMS (OCCTFP)

OCCTFP consists of a number of funding programs for transportation projects. OCCTFP programs are administered by OCTA. The Combined Transportation Funding Programs Manual provides guidelines and procedures necessary for Orange County agencies to apply for local

funding sources. Programs contained in the manual are:

a) Arterial Highways Rehabilitation Program

The Arterial Highways Rehabilitation Program (AHRP) has been developed to deal with the pavement condition in Orange County. Specifically, the AHRP is designed to fund pavement rehabilitation projects on the Master Plan of Arterial Highways (MPAH) facilities throughout Orange County.

The Arterial Highways Rehabilitation Program is administered by OCTA and replaces the former Arterial Highways Financing Program.

All jurisdictions in Orange County whose Circulation Plan is consistent with the MPAH are eligible to participate in the program. Agencies should contact OCTA for details.

b) Measure M Streets and Roads Programs

The Measure 'M' Growth Management Program requires a locally collected and administered traffic mitigation fee to guarantee that new development pays its fair share toward dealing with traffic generated by the new development. This requirement is addressed in Policies 1.2 and 5.1 of this Component and Policy 4 of the Growth Management Element of County General Plan.

These policies provide assurances that the impacts of a development are adequately mitigated by the developer pursuant to the Growth Management provisions of Measure M requirement for a "minimally acceptable base fee level for areas under the County jurisdiction".

5. COMPUTER MODELING

The countywide travel demand forecast model is known as the Orange County Transportation Analysis Model (OCTAM) and is used to forecast future travel demand on the County Master Plan of Arterial Highways (MPAH) network. The forecasts are used to plan and design roadways and transportation facilities needed to support land use development in the County.

6. ROAD IMPROVEMENT MONITORING

a) Monitoring Report

This is a detailed analysis of traffic conditions at intersections impacted by development in unincorporated areas of the County. The analysis is done for horizons of three and five years. The report also contains specific mitigations that are

necessary to ensure LOS consistent with standards specified in the Growth Management Plan Element. In addition to other applicable requirements of the General Plan, the County shall prepare, or cause to be prepared, an annual monitoring report regarding the average number of daily vehicle trips generated by the land uses at Orange County's Central Park shown on Map III-1. The County shall approve land uses within Orange County's Central Park consistent with the General Plan in a manner to insure that the average number of daily vehicle trips generated by the authorized land uses within Orange County's Central Park at build out shown on Map III-1 do not exceed ninety-six thousand (96,000) vehicle trips per day on average.

b) Development Agreement Implementation Program

The County has entered into a number of Development Agreements with major county developers in the unincorporated areas of the County. Each contains specific infrastructure improvements, including roadways, to be completed by the developer by certain development milestones.

The intent of these agreements is to provide a mechanism for phasing new development in conjunction with the construction of infrastructure needed to serve that development. A Development Agreement Implementation Program has been established to define and clarify the benefits obtained through these agreements. This program is administered by OCPW.

c) Facility Implementation Program

The Facility Implementation Program (FIP) is based on the 11 "Measure M" GMAs and contains FIPs for only those GMAs with a large amount of unincorporated areas. The FIPs outline infrastructure improvements and phasing of those improvements necessary to support projected development in the unincorporated areas.

7. TRANSPORTATION DEMAND MANAGEMENT (TDM) PROGRAMS

a) County TDM Ordinance

The County adopted a Transportation Demand Management Ordinance on April 30, 1991 to address the County's strategy to promote transportation demand management.

b) Transportation Management Associations (TMAs)

A TMA is a proactive, non-profit,

public benefit organization, may be required through conditions of approval, for the purpose of helping employers, developers, building owners, government agencies and others to collectively establish policies, programs and services to address local transportation problems. TMAs provide a means for the County to achieve trip reduction goals such as those contained in the County's TDM Ordinance (Ordinance No. 3820) and in the SCAQMD's Rule 1501.

Implementation Schedule: Ongoing

Responsible Agency: OCPW

Source of Funds:

- Local Park Trust Fund
- Local Park Maintenance Agency Funds
- Grants
- General Fund
- Special Taxes (subject to two-thirds approval of local voters)

8. CONGESTION MANAGEMENT PROGRAM

Proposition 111 was approved by the State of California voters on June 5, 1990. AB 1791, an element of Prop 111 legislation, requires that each county with an urban area population of 50,000 or more develop and implement a Congestion Management Plan (CMP). In response to AB 1791 Orange County adopted its first CMP in June of 1991. The intent of the CMP is to foster coordination among land use, transportation planning and air quality management. The CMP is administered by OCTA.

9. INTERMODAL SURFACE TRANSPORTATION EFFICIENCY ACT (ISTEA) OF 1991 & TRANSPORTATION EQUITY ACT (TEA-21)

The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 and TEA-21 in 1998 established Federal funding for transportation.

TEA-21 preserves the ISTEA philosophy but TEA provides the financial wherewithal lacking in ISTEA. TEA-21 provides 217 billion dollars in spending authorization over the next six years - a 40 percent increase over ISTEA. The Act includes a measure which requires that funds included in the Federal Highway Trust Fund be spent primarily on maintenance and construction of the nation’s transportation infrastructure.

OCTA is primarily involved in the programming and selection of projects for TEA-21 Programs.

10. CIRCULATION PLAN AMENDMENT

The County Circulation Plan, as well

as the circulation plans for the various cities**,** is required to be consistent with the Master Plan of Arterial Highways (MPAH), which is administered by OCTA. Amendments to the County Circulation Plan may require amending the MPAH. The procedure for amending the MPAH is set forth in the OCTA publication entitled "Guidance for Administration of the Orange County Master Plan of Arterial Highways" dated November 1993.

COMPONENT TWO: BIKEWAYS PLAN

Overview

The current Bikeways Plan is excerpted from the initial Master Plan of Countywide Bikeways that was adopted in 1971. It defines a network of local bikeways that interfaces with and complements adjacent local and regional bike routes. The Bikeways Plan supports General Plan policies and covers the unincorporated areas of Orange County.

Bicycle routes provide an alternative transportation mode for all trips, including commuting, shopping, school, and recreation. The Bikeways Plan defines goals, policies, and objectives for planning, design and construction of an integrated system of on-road and paved off-road bicycle facilities in the unincorporated areas of the County. The emphasis is placed on bicycle route that complement other transportation modes (e.g., transit, car-pool, etc.) serving activity centers (e.g., employment, educational, civic, etc.).

The Bikeways Plan also addresses the recreational objectives of bicycling. This is done in concert with other Countywide recreational programs such as regional parks and riding and hiking trails.

The Bikeways Plan Component of the Transportation Element provides the policies and practices that help to define the role of bicycle travel within Orange County's unincorporated areas. Coordination of the Bikeways Plan's development and implementation with OCTA and the various cities of Orange County is an important part of the process.

"The thing about a bicycle is that it's difficult to feel unhappy on one and impossible to feel old."

Sunset Magazine, September 1999

CLASSIFICATION

The Bikeways Plan exhibit (Figure IV-7) indicates the general location and classification of all officially adopted bikeways in the County unincorporated areas, whether existing or proposed. The Caltrans Highway Design Manual can be referenced for clarification and specific detail on design speeds, grades, signing, striping and other design issues. This document has been modified for adoption by OCPW in the Orange County Highway Design Manual.

The basis for the design of bikeways in the County's unincorporated areas shall be, in order of precedence, Chapter 1000 of the Orange County Highway Design Manual, followed by Chapter 1000 of the Caltrans Highway Design Manual. Additional information can be found in the County's adopted Standard Plans and the OCTA Commuter Bikeway Strategic Plan (CBSP). Laws pertaining to the use of bicycles and trail facilities can be found in the Vehicle Code of the State of California (CVC). The rights and rules applied to the operation of a bicycle on arterial highways, as shown on the County Circulation Plan (CP), are set forth in the CVC, Division 11, Section 21200 as follows:

> *Every person riding a bicycle upon a highway has all of the rights and is subject to all of the provisions applicable to the driver of a vehicle by this division, ...*

Following is a description of the characteristics of Class I, II and III bikeways.

Class I Bikeway (Bicycle Trail)

A Class I bicycle trail is a paved off-road facility which is physically separated from a roadway and designated primarily for the use of bicycles. Crossflows by pedestrians and motorists are to be minimized. (See Figure IV-8.) However, where significant pedestrian traffic can be anticipated on a two-way Class I bikeway, a design standard for combined pedestrian/bicycle traffic is provided in Section 1003.1 (1) of the Orange County Highway Design Manual "Bikeway Planning and Design".

Bicycle trails typically serve corridors not served by streets and highways, or where sufficient right-of-way exists to construct a separate facility parallel to the roadway. They can provide both recreational and commuter opportunities. These facilities can often serve to bridge gaps in the system caused by man-made or natural barriers. They often utilize abandoned railroad rights-of-way, utility easements, flood control

channels, parks and similar linear open space corridors.

Class II Bikeway (Bicycle Lane)

A Class II bicycle lane is a facility featuring a striped lane on the paved area of a road for preferential use by bicycles. It is located along the edge of the paved area outside the motor vehicle travel lanes and shall be restricted to parking. (See Figure IV-9.)

Where sufficient pavement width exists, it may be located between a parking lane and the outside motor vehicle travel lane. (See Figure IV-10.)

Section 1003.2 (1) of the Orange County hway Design Manual "Bikeway Planning and Design" provides for a typical width of 8 feet, measured from curb face, for a Class II bikeway on a curbed street, and specifies that additional width be provided where parking is anticipated. However, a minimum width of 5 feet is acceptable if more width is needed in the travel way of existing roadways to facilitate re-striping for additional turn lanes.

On arterial highways in the County's unincorporated areas where a Class II trail is designated on the Bikeways Plan, parking shall be prohibited where insufficient width exists to accommodate both parking and bicycle lanes, in addition to the required number of vehicular travel lanes.

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A bike lane serves to differentiate the right-of-way assigned to bicyclists and motorists, and provides for more predictable movements by each. A bike lane is typically identified by black and white "Bike Lane" signs (Sign type "R81", State of California Uniform Sign Chart), special lane striping, and may have "Bike Lane" stencils on the pavement. Bike lanes are one-way facilities intended to be ridden in the same direction as adjacent motor vehicle flow.

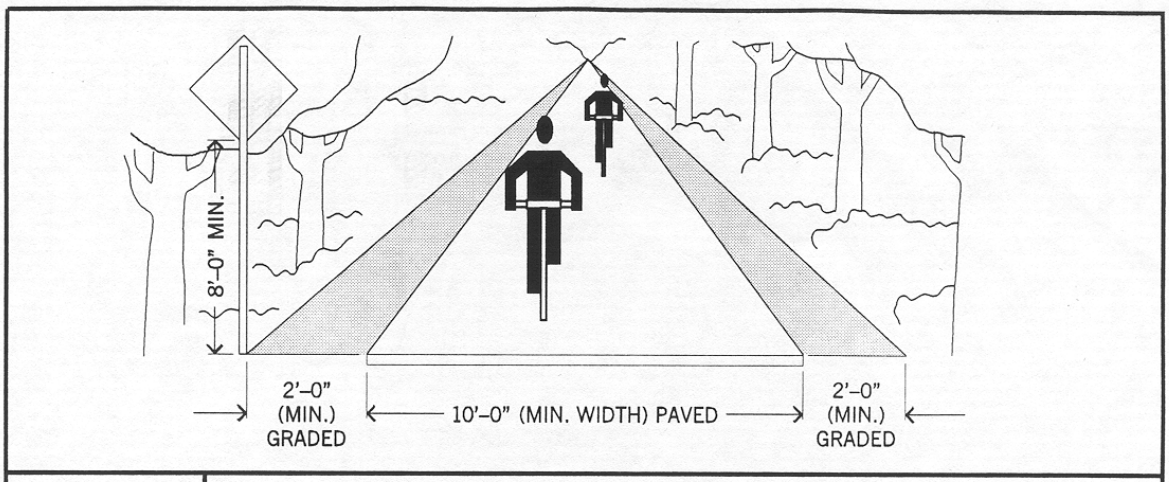


Figure IV-8

Chart 2–1	TWO–WAY BIKE PATH ON SEPARATED RIGHT–OF–WAY

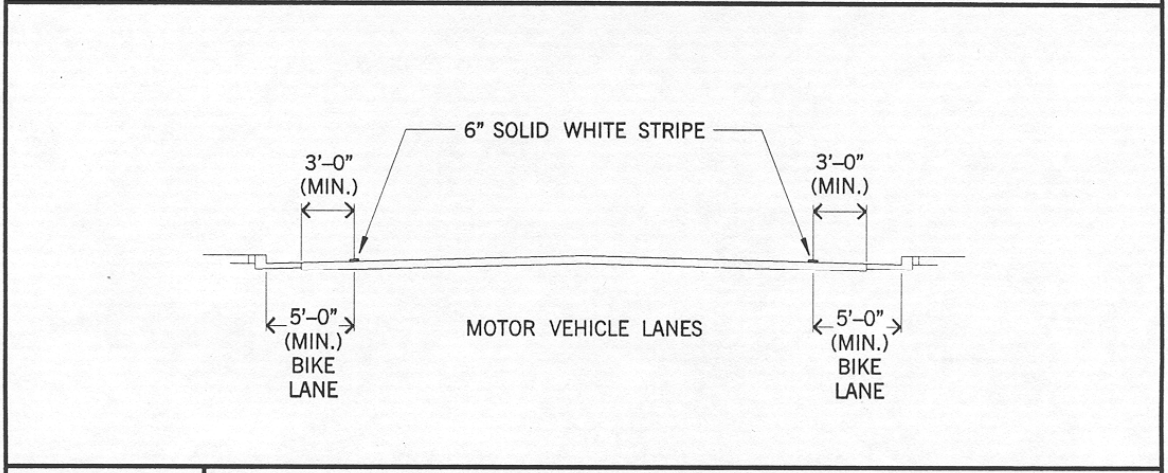


Figure IV-9

Chart 2–2	BIKE LANE PARKING PROHIBITED

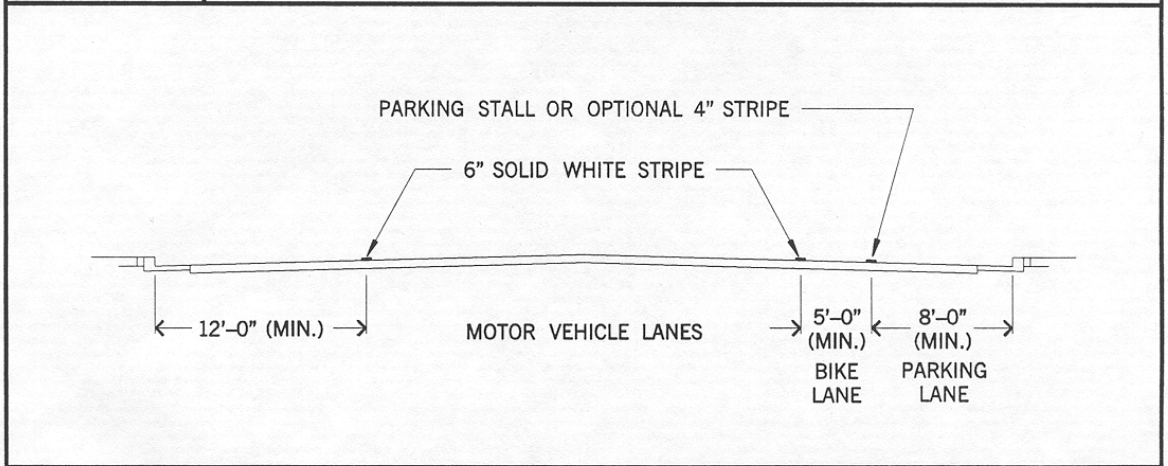


Figure IV-10

Chart 2–3	BIKE LANE PARKING PERMITTED

Class III (Bicycle Route)

A Class III bicycle route is a facility typically identified by green and white (Type "~~G93~~ D11-1") "Bike Route" guide signing only. There usually are no special lane designations, and parking may be permitted. Bicycle traffic may share either the roadway with motor vehicles, or a sidewalk with pedestrians and, in either case, bicycle usage is considered secondary. Bike routes are established as a means to connect otherwise discontinuous segments of Class I or Class II bikeways.

Undetermined

A bikeway route designated on the Bikeways Plan map as "Undetermined" indicates that the ultimate trail category or classification, and/or its alignment has not yet been determined or officially adopted due to topographical or right of-way constraints, or other considerations.

GOALS, OBJECTIVES AND POLICIES: *Bikeway Plan*

This section provides guidance regarding the Bikeways Plan Component of the Transportation Element.

Goal 1

Develop and implement a bikeway plan that maximizes the opportunities for non-motorized vehicle transportation, and meets the recreation and local transportation needs of the residents of Orange County's unincorporated areas.

- ***Objectives***

  1.1 Develop a bikeways network for the unincorporated areas that provides non-motorized alternatives for commuter travel as well as recreational opportunities.

  1.2 Plan and develop the County's Bikeways Plan in coordination with the cities, OCTA, and CalTrans. This system will be designed to complement and interface with the overall transportation network existing and planned for Orange County, including the individual cities' bikeways and circulation plans.

  1.3 Develop a bikeway network that maximizes the safety and convenience of users of all levels of experience within that system.

  1.4 Promote coordination among the County, the Cities, OCTA, and other agencies in providing an integrated bikeways system.

  1.5 Review and update the Bikeways Plan as needed, in order to assure compatibility with the other elements of the County General Plan, and with the bikeways plans of OCTA, the Cities, and adjacent counties.

1.6 Actively seek all available means of financing bikeways including State and Federal grants.

- ***Policies***

1.1 Role of the Bikeways Plan:
Coordinate and facilitate the implementation of the unincorporated County's bikeway system, utilizing input from the bicycling community, the cities, and other agencies.

1.2 Seven-Year Plan:
Establish and annually update a Seven-Year Plan to provide direction for bikeway implementation and to serve as a guide for grant applications. The plan will include both commuter and recreational bikeways.

1.3 Arterial Highways:
Provide for bicycle access to arterial highways as depicted on the Circulation Plan. Bicycle travel will also be accommodated on arterial highways during roadway construction, widening or other improvements, whenever feasible and practical.

1.4 Commuting:
Design bicycle routes to connect residential areas with major activity centers (employment, educational, civic, etc.) by requiring, through the subdivision process, the dedication of right-of-way and construction of designated bikeways as conditions of development within the unincorporated areas.

1.5 Recreation:
Plan bicycle routes to facilitate access to recreational areas such as regional parks, beach areas, and major tourist commercial/recreational facilities.

1.6 System Connectivity:
Plan a bikeway network to interface with other modes of transportation (train or transit stations and Park-N-Ride lots, etc.) to plan for, and provide space for carrying recreational and commuting bicyclists on public transportation systems where feasible.

1.7 Modal Interaction:
Encourage other modes of transportation (buses, trains, etc.) to plan for, and provide space for carrying recreational and commuting bicyclists on public transportation systems where feasible.

1.8 Scenic Value:
Locate bikeways along designated scenic highways wherever environmentally,

physically, or economically feasible, and encourage the development of scenic vista points and rest areas where feasible and appropriate.

1.9 *Rights-of-Way:*
Construct bikeways in existing and abandoned public rights-of-way along flood control channels, parks, roads, and utility and railroad rights-of-way where feasible, and where a need can be demonstrated.

1.10 *Public Information:*
Provide bicycle trail and safety information to the public by publishing bike trail maps and representing the County at trade shows, rideshare fairs, etc.

1.11 *Design Standards:*
Design and construct bikeways in accordance with County and Caltrans standards in order to maximize safety and minimize potential conflicts with pedestrians and motor vehicles.

1.12 *Bicycle Safety:*
Separate bicycle and automobile traffic wherever possible, taking into consideration safety, users of the facility, economic factors, and physical feasibility, and by designing only one-way bike lanes, thereby minimizing conflicts at intersections and reducing the hazards of bicyclists traveling against traffic.

1.13 *User Convenience:*
Encourage the provision of bicycle racks, showers, lockers, and other storage facilities, where practical and economically feasible, when reviewing discretionary permits for major activity centers.

1.14 *Regional Continuity:*
Encourage other jurisdictions to adopt a system of bikeways that complements the County system and the Commuter Bikeways Strategic Plan (CBSP) administered by OCTA.

1.15 *Regional Consistency:*
Periodically revise the Bikeways Plan component of the Transportation Element, when warranted, to reflect changing conditions, and evaluate proposed development projects for compatibility with the County regional bikeways system through the subdivision and discretionary permit review process.

1.16 *Funding:*
Solicit and utilize all sources of local, regional, State, and Federal funds to plan, acquire right-of-way for, and construct bikeways, including such sources as SB 821

and SB 244 (CalTrans Bike Lane Account) funds; County Road funds and Harbors, Beaches and Parks funds; and private grants.

1.17 Development Commitment: Encourage developers to provide local bicycle trails, as well as require construction of applicable Bikeways Plan bikeways within their projects as conditions of development approval.

IMPLEMENTATION PROGRAMS: *Bikeway Plan*

1. SUBDIVISION PROCESS

Programs involve a review of subdivision maps for consistency with the Bikeways plan, and a requirement that new developments dedicate necessary right-of-way, and develop bikeway facilities according to Bikeways Plan classification and design specifications.

2. FUNDING

Bikeway funding programs (Bicycle and Pedestrian Facilities (BPF) Funding Program, SB 244, etc.) accord priority to those projects which improve bicycle access to employment centers, educational facilities, and commercial developments, as well as to recreational areas. The BPF, formerly referred to as SB 821, funding program is administered by OCTA.

COMPONENT THREE: SCENIC HIGHWAYS PLAN

Overview

The Scenic Highways Component of the General Plan was first adopted by the Board of Supervisors on June 12, 1973 (Resolution No. 73-659). The component identifies the County's scenic highway routes. The primary purpose of the Scenic Highways Component is to define the policy guidelines pertaining to the implementation of the Scenic Highways Plan (Figure IV-11).

The Scenic Highways Plan attempts to incorporate safety, utility, economy, and aesthetics into the planning, design and construction of scenic highways.

CLASSIFICATION

The County's designated scenic highways have been divided into two categories: Viewscape Corridors and Landscape Corridors (Appendix IV-4).

Viewscape Corridor (Type 1)

A viewscape corridor is a route which traverses a corridor within which unique or unusual scenic resources and aesthetic values are found. This designation is intended to minimize the impact of the highway and land development upon the significant scenic resources along the route. Safety roadside rests and vista points should be developed, when feasible and where appropriate, to enhance any exceptional

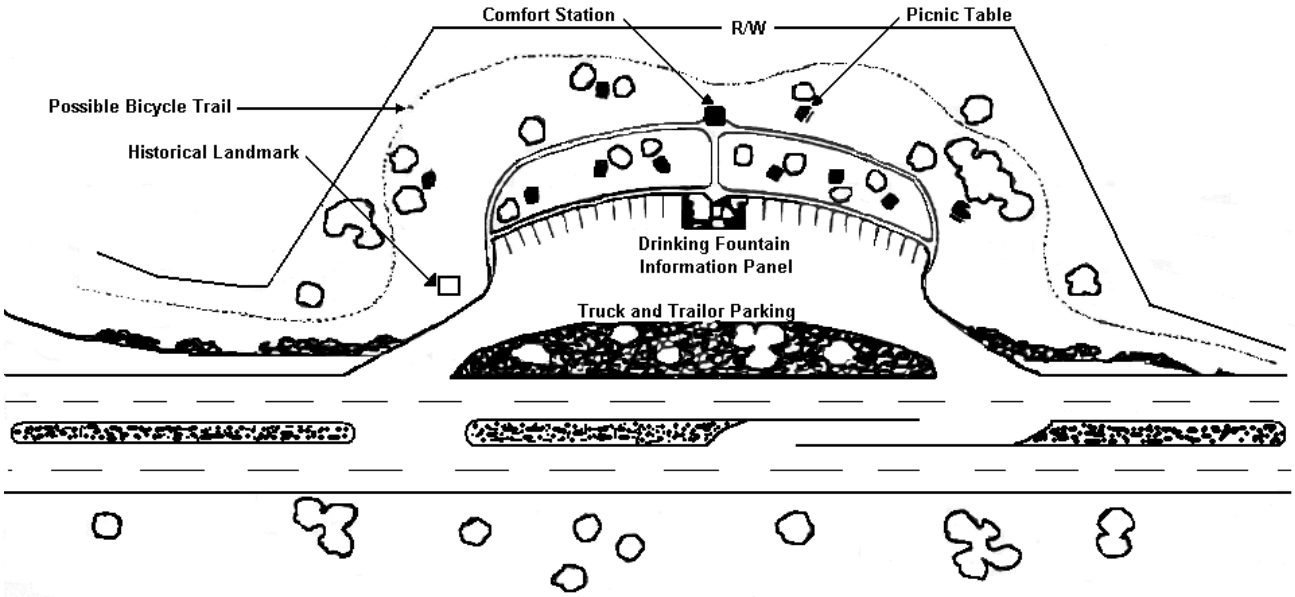
scenic values (Figures IV-12 and IV-13).

Insert Fig. IV-11 (Scenic Highway Plan Map)

Left blank for Fig. IV-11 (11x17)

Figure IV-12

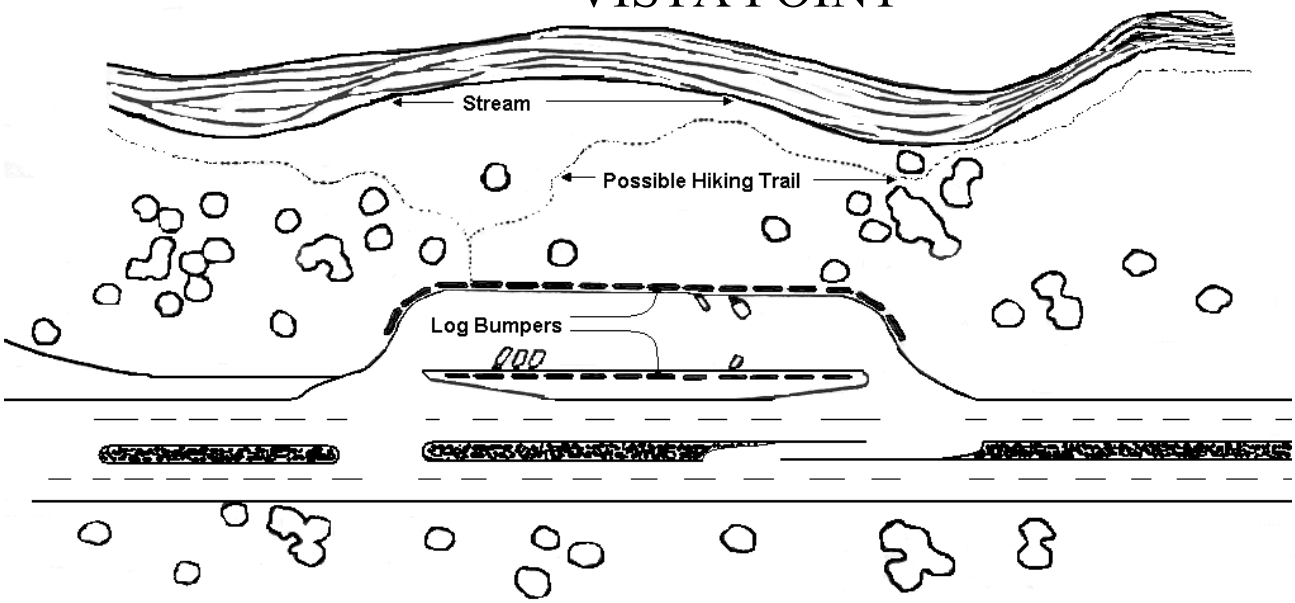
ROADSIDE REST



Roadside Rest: Facilities of limited size (usully 1 to 3 acres) located along highways for the rest, comfort and enjoyment of the scenic highway traveler, may include sanitary facilities, picnic tables and landscaping.

Figure IV-13

VISTA POINT



Vista Point: A designed turnout with a scenic view and with sufficient width to provide for a paved parking area and a separated access lane from the traveled portion of the highway.

Development of the right-of-way should, to the extent possible, follow the adopted Viewscape Typical Section (Figure IV-14). If utilization of the typical section would destroy the scenic amenities of the corridor, a modification of the standard can be considered. The appropriate width and development of the right-of-way shall be discussed/considered in the scenic corridor implementation plans.

Landscape Corridor (Type 2)

A landscape corridor traverses developed or developing areas and has been designated for special treatment to provide a pleasant driving environment as well as community enhancement. Development within the corridor should serve to complement the scenic highway.

Development of a landscape corridor should, to the extent possible, follow the adopted Landscape Typical Section (Figure IV-15). Any variation to the typical section should be addressed in the scenic corridor implementation plans.

GOALS, OBJECTIVES AND POLICIES: *Scenic Highway Plan*

This section provides guidance for goals, objectives and policies regarding scenic highways.

Goal 1

Preserve and enhance unique or special aesthetic and visual resources through

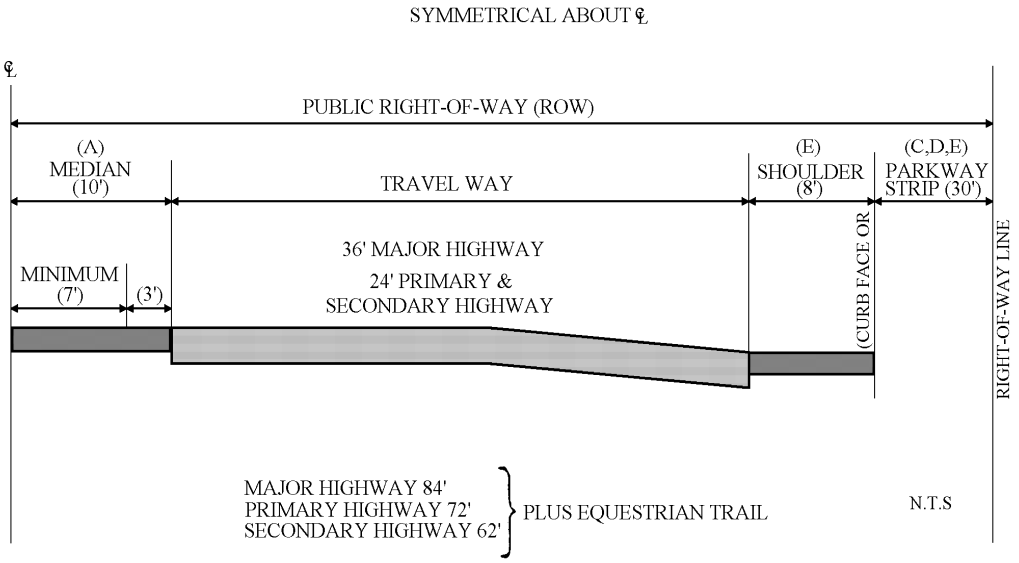


FIGURE IV-14 VIEWSCAPE HALF-SECTION (TYPICAL)

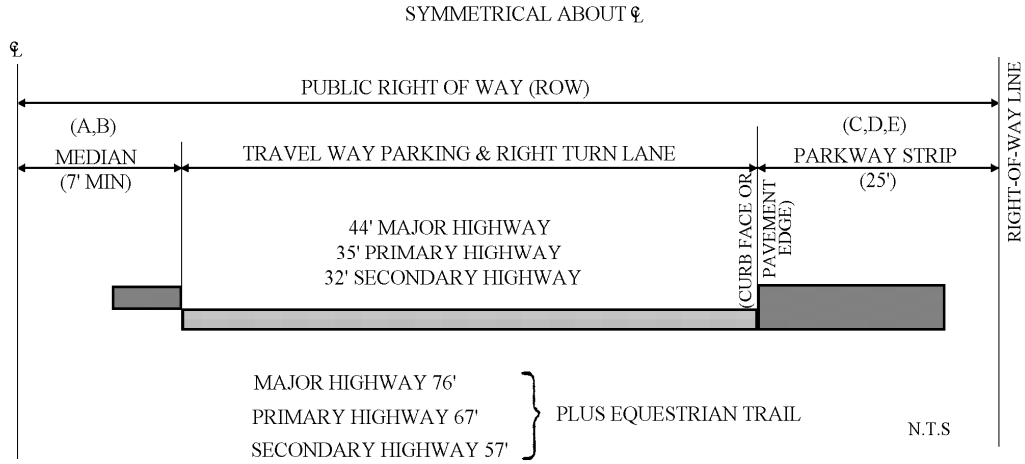


FIGURE IV-15 LANDSCAPE HALF-SECTION (TYPICAL)

LEGEND (A) NORMALLY NO MEDIAN FOR SECONDARY HIGHWAYS

(B) 15' MINIMUM FOR EXISTING TREE ROW (E.G. EUCALYPTUS)

(C) PARKWAY STRIP TO ACCOMODATE HIGHWAY BEAUTIFICATION & PAVED FACILITIES

(D) ADD 10' ON ONE SIDE FOR MASTER PLAN EQUESTRIAN TRAIL

(E) PRECISE WIDTH OF PARKWAY STRIP AND THE USE OF CURBS AND GUTTER OR A.C. DIKE TO BE DETERMINED BY SCENIC CORRIDOR IMPLEMENTATION PLANNING

sensitive highway design and the regulation of development within the scenic corridor.

- ***Objectives***

  1.1 Protect and enhance the County's beauty, amenities and quality of life within the unincorporated areas.

  1.2 Add to the pleasure of its residents and visitors by enhancing scenic routes.

  1.3 Coordinate the development of new scenic corridors with CalTrans, OCTA, the cities, and the development community, in order to preserve the aesthetic qualities of the environment.

  1.4 Preserve established Scenic Highways in order to protect the existing scenic qualities of these corridors.

  1.5 Develop the roadway portion of the scenic corridors in a manner that recognizes the natural scenic resources of the corridor and is sensitive to them to the maximum extent feasible.

  1.6 Require sufficient setback from the scenic corridor, where feasible, for the purpose of preserving the corridor's scenic qualities.

- ***Policies***

  1.1 Project Consistency:
  Require preparation and approval of highway plans demonstrating project consistency with the intent of the Scenic Highway Component, prior to tract map recordation. This can be accomplished through the subdivision, discretionary permit, Feature or Area Plan review process.

  1.2 Offer of Dedication:
  Where necessary to preserve unique or special visual features, impose conditions on development within a scenic highway corridor to require dedication of scenic easements consistent with the adopted corridor plan.

  1.3 Addition to the Scenic Highway Plan:
  Preserve scenic routes which have exceptional or unique visual features, but are not necessarily designated as arterial highways on the County Circulation Plan, by placing them on the Scenic Highways Plan. Development of scenic highways shall be in conformance with a Specific Plan prepared in accordance with the Scenic Highway Implementation Planning Guidelines (Appendix IV-5).

1.4 Cooperative Planning:
Connect County-designated scenic highways with city-designated scenic highways; adjacent-County-designated scenic highways, and/or those in the State Scenic Highway system so as to form a linked system.

1.5 View Design:
Where feasible, through the design process and alignment studies, develop the scenic highway in a manner which takes into account the cone of vision of the motorist. Consider both the short and long-range views available along the way while enhancing them with foreground framing.

1.6 Highway Design:
Design the roadway to have a visual quality and riding comfort resulting from its horizontal and vertical design. Introduce curves where feasible to take advantage of natural or man-made scenic features.

1.7 Inclusion of Trails:
Incorporate pedestrian, equestrian, and bicycle trails into the right-of-way of scenic highways as designated by the County's Bikeways Plan and the Master Plan of Regional Riding and Hiking Trails.

1.8 Road Slope Improvement:
Where feasible, utilize contour grading and slope rounding to gradually transition graded road slopes into the natural configuration consistent with the topography of the area.

IMPLEMENTATION PROGRAMS: *Scenic Highway Plan*

1. SUBDIVISION PROCESS

During the review of subdivisions and discretionary permits, assure that the number of access points (e.g., driveways, local roads, etc.) on scenic highways are minimized.

Attachment 6

XI. GROWTH MANAGEMENT ELEMENT

CA/KB

OVERVIEW

The Growth Management (GM) Element, one of the nine elements of the General Plan, contains County policies on the planning and provision of traffic improvements and public facilities that are necessary for orderly growth and development. The GM Element presents policies and programs for traffic improvement phasing, facility and development phasing plans, and provides guidance for future facility implementation plans for the County.

The GM Element is divided into six sections. The first section provides an overview of the scope and purpose of the Element. The remaining sections are arranged as follows:

- Purpose of the Element
- Terms and Definitions
- Goals, Objectives and Policies
- Implementation Programs

PURPOSE OF THE ELEMENT

The purpose and intent of this Element is to mandate that growth and development be based upon the County's ability to provide

an adequate circulation system; adequate sheriff, fire, paramedic and library services and other necessary facilities; and through all of the processes established in this Element, natural resources and the natural environment shall be protected.

Consistency with Other General Plan Elements

A major goal of the Growth Management Element is to ensure that the planning, management, and implementation of traffic improvements are adequate to meet the current and projected needs of Orange County.

While this goal is a high priority, it must be achieved while maintaining internal consistency among the other elements of the General Plan as required by state law. Therefore, the GM Element does not replace or supersede any of the other General Plan elements; instead the GM Element addresses, amplifies and supports traffic improvement and public facility and development phasing concerns identified in the other General Plan elements.

The Growth Management Element is implemented through various integrated programs developed to support and carry out its goals, objectives, and policies.

The GM Element is the most current expression of County growth management policies. Consequently, although there is a certain amount of overlap among the General Plan elements, the GM Element is the key resource document for growth management concerns.

The GM Element achieves internal consistency with the other General Plan elements through the pursuit of common major goals such as balanced land use and public facilities development. Consistency with specific elements is described below:

- The Public Services and Facilities Element provides policies and programs for the ongoing planning of public facilities by the County and Special Districts. The figures contained in the Land Use, Transportation, Recreation, and Resources (Open Space) Elements shall provide General Plan policy guidance for implementing public facilities planning.

- Major County public facilities shall conform to the adopted Noise and Safety Elements.

- Innovative financing, funding, and implementation programs which could serve to minimize infrastructure costs and thus, housing costs are included in the GM Element consistent with Housing Element direction.

- Regional transportation facilities are mapped in the Transportation Element.

- Regional public facilities (excluding transportation) are mapped, to the extent feasible, as Land Use Category 4 (Public Facilities) on the Land Use Designations figure.

- The Public Services and Facilities Element provides specific implementation and financing policies and programs for all types of transportation facilities. The Transportation Element (i.e., Circulation Plan) is the County master plan for transportation facilities within the unincorporated area and is consistent with the master plan of Arterial Highways (MPAH) administered by OCTA. It provides general policy and program guidance for facility planning and siting.

- The Land Use Element contains the Growth Management Program that implements the Phased Development and Land Use/Transportation Integration policies of the Land Use Element. The Growth Management Program requires proponents of major land use projects to submit annual monitoring reports which project future development activity, identify public service/infrastructure deficiencies, and provide mitigation measures. An analysis of the annual monitoring reports is submitted to the Board of Supervisors as part of each update to the County's Development Monitoring Program. Projects which result in deterioration of service levels may be modified or deferred by the Board of Supervisors until adequate service levels can be provided.

Implementation Process

While this GM Element provides a significant resource document for future growth management efforts, it is not the final action necessary to establish a comprehensive public facilities and growth management plan for the County of Orange. Rather, the intent of the GM Element is to establish the basic policy framework for future implementing actions, plans, and programs. In addition, future amendments to the GM Element may be required to reflect the results of the implementation process.

The GM Element contains specific programs that serve as the primary vehicle for implementation of its policies. Privately initiated Land Use Element amendments and zone changes will be specifically reviewed for consistency with the GM Element policies.

Relationship to the State and Federal Highway System

While the GM Element addresses the need for the phasing of arterial highway improvements, it is recognized that the State and Federal highway system is a significant component of Orange County's overall transportation system.

Existing Freeway Conditions

In recent years, the Orange County Freeway system has undergone significant changes.

Many freeway to freeway connection improvements have been completed. Additional general purpose and HOV lanes have also been added. Collectively, when fully implemented these changes will significantly reduce congestion on Orange County's freeway system.

Impact of Freeway System on County Arterial Highway System

The Orange County Master Plan of Arterial Highways, which is administered by the Orange County Transportation Authority, defines an arterial highway system intended to support and serve existing and adopted land uses in both incorporated and unincorporated areas of the County. The arterial system is designed to serve as part of a balanced transportation system (autos, trucks, buses, bicycles, pedestrians).

The arterial system provides for both through movement and a collector function. Major and Primary Arterial Highways are intended to handle the bulk of intra-regional traffic and complement both the freeway system and the local street network.

Secondary arterials and Commuter arterials serve mainly as collectors which funnel traffic from local streets to the Major and Primary arterial system.

As congestion continues to increase on the freeway system, more drivers are utilizing the arterial system, particularly those parallel to freeways or those arterials serving the same trip destination as the freeways. Consequently, some of these parallel arterials, particularly the north/south ones, are becoming increasingly congested. This situation is of special concern on those arterials which provide access to the freeway system.

Programs to Correlate County General Plan with Freeway System

While it is acknowledged that deficiencies do exist and will continue to exist on the freeway system for reasons beyond the control of County government, the County will promote the correlation of its General Plan programs, including the GM Element, with the freeway system through the following programs:

1. *Support Countywide Implementation of the Measure M Countywide Growth Management Program (GMP)*

   One of the key implementation programs of the GM Element is the action plan for countywide implementation of the Measure M GMP.

   Given the fact that much of the traffic on the County's freeway system results from areas outside the unincorporated area where the County has no land use jurisdiction, the most effective method of improving the freeway system is on a regional basis. The Inter-Jurisdictional Planning Forums, convened pursuant to the Measure M Countywide Growth Management Program, provide an opportunity for the County to participate with local jurisdictions in addressing cumulative traffic impacts and coordinating improvements to transportation and other facilities. The Inter-Jurisdictional Planning Forums also provide the opportunity to meet with local jurisdictions to discuss proposed development projects with multi-jurisdictional impacts. In addition, the concept of implementing new arterial highway links commensurate with new development, including links parallel to the freeway system, is required by the GM Element and will serve to mitigate impacts on the freeway system.

2. *Orange County Congestion Management Program*

   With the passage of the gas tax increase (Proposition 111) in June 1990 came a requirement that urbanized areas in the State adopt a Congestion Management Program (CMP). The goals of the CMP are to reduce traffic congestion and provide a mechanism for coordinating land use development and transportation improvement decisions. In order for a jurisdiction to be eligible for Proposition 111 funds, no intersection on an adopted CMP Highway System may be allowed to deteriorate to a Level of Service (LOS) worse than LOS E or the existing (1991) LOS if worse than LOS E without mitigations being prescribed in an adopted deficiency plan.

   The Orange County CMP, adopted in 1991, established the freeway system and major arterial highways as the Orange County CMP Highway System. The Orange County CMP established a process for use by each jurisdiction to analyze the impacts of proposed development projects on the CMP Highway System. Each jurisdiction is required to analyze development projects to determine whether project-generated traffic will cause CMP intersections/links to exceed their LOS standards and to assess feasible mitigation measures to maintain the adopted LOS Standard. In addition, the Orange County CMP includes mechanisms for inter-jurisdictional

coordination where a proposed development is determined to generate an increase in traffic on CMP links/intersections beyond the jurisdiction's boundaries.

3. *Improvements to the Existing Freeway System*

The County Multi-Modal Transportation Study (MMTS), which is the "blueprint" for countywide transportation improvement, recognized that much of the existing freeway system will need additional capacity. While the County of Orange is not responsible for these improvements, the County has provided and will continue to provide local support for these improvements through various programs. These include: 1) County assistance on the design and construction process for necessary freeway improvements in order to meet project schedules; 2) County support of the programs undertaken by the Orange County Transportation Authority for the planning and financing of needed freeway improvements; and 3) Ongoing coordination between the County and CalTrans through the environmental review process whereby CalTrans reviews development projects for impacts on the freeway system.

From the beginning of 1997 through mid-2003, California will need 1.1 to 1.2 million additional housing units.

The County Master Plan of Arterial Highways also proposes the development of major new travel corridors which would be needed to carry future traffic from South County and North County to the central portion of the County. These include the San Joaquin Hills and Foothill Transportation Corridors (intended to provide relief to Pacific Coast Highway and the Santa Ana and San Diego Freeways) as well as the Eastern Transportation Corridor (intended to provide relief to the Costa Mesa-Newport Freeway) and the proposed extension of the Orange Freeway to the San Diego Freeway.

By undertaking the three programs outlined above, the County will be supporting, through local action, enhanced coordination of the County General Plan and the County freeway system.

TERMS AND DEFINITIONS

For the purposes of this Element, the following terms shall have the following meanings:

- **Comprehensive Phasing Plan (CPP)** shall mean a road and infrastructure improvement and financing plan which meets the established level of service requirements in this Element and covers the impacted Community Analysis Areas (CAAs) within significant unincorporated areas of the County. With regard to road improvements, a CPP may be similar to the Foothill Circulation Phasing Plan (FCPP) and must include level of service requirements and take into account measurable traffic impacts on the

circulation system.

- **Critical Movement** shall mean any of the conflicting through or turning movements at an intersection that determine the allocation of green signal time.

- **Development Phasing Plan** shall mean a plan which establishes the requirement that building and grading permits shall be approved or issued in a manner which assures implementation of required improvements of arterials, public facilities, and services in conjunction therewith. The County shall specify the order of improvements and the number of dwelling units based, at a minimum, on mitigation measures adopted in conjunction with environmental documentation and other relevant factors.

- **Deficient Intersection Fund** shall mean a trust fund established to implement necessary improvements to existing intersections that do not meet the Traffic Level of Service. ~~Policy.~~

- **Deficient Intersection List** shall mean a list of intersections which do not meet the Traffic Level of Service Policy for reasons which are beyond the control of the County (e.g., ramp metering effects, traffic generated outside the County's jurisdiction, etc.). Additional intersections may be added by the County to the deficient intersection list only as a result of conditions that are beyond the control of the County and after a public hearing.

- **Foothill Circulation Phasing Plan (FCPP)** shall mean the comprehensive road improvement and financing plan for the Foothill area adopted by the Board of Supervisors on September 15, 1987 and as may be amended.

- **Growth Management Areas (GMAs)** shall mean those Countywide GMAs, established for planning purposes as required by Measure M: The Revised Traffic Improvement and Growth Management Ordinance. The boundaries of said GMAs shall be the same as those for the Countywide GMAs approved by the Regional Advisory and Planning Council (as required by Measure M), and as may be subsequently amended.

- **Growth Management Element** shall mean the Growth Management Element of the Orange County General Plan, a permissive element of the General Plan adopted in accordance with Government Code Section 65303, et seq.

- **Measurable Traffic** shall mean a traffic volume resulting in a 1% increase in the volume/capacity ratio of the sum of all critical movements.

- All other terms shall be as defined in the Orange County Zoning Code as of the date of adoption of this Element.

GOALS, OBJECTIVES AND POLICIES

Goals

This section presents the existing and future goals of the Growth Management Element. The goals of the GM Element are as follows:

1. *Reduce traffic congestion;*
2. *Ensure that adequate transportation facilities, public facilities, equipment, and services are provided for existing and future residents; and*
3. *Protect the natural environment of Orange County.*
4. *Balance the needs of congestion management with statewide goals related to infill development, promotion of public health through active transportation, and reduction of greenhouse gas emissions.*

These goals shall be accomplished through implementation of the policies and programs set forth in this Element.

- ***Objectives***

Achievement of these goals shall be measured by the following objectives.

1. ***Development Phasing:***
   Development shall be phased in a manner consistent with applicable Comprehensive Phasing Plan.
2. ***Transportation:***
   The circulation system shall be implemented in a manner which achieves the established Traffic Level of Service Policy. On July 1, 2020, Senate Bill (SB) SB 743 provisions applied statewide, and the County of Orange is utilizing the Vehicle Miles Traveled (VMT) metrics in County guidelines to assist with our evaluation of projects within unincorporated Orange County. The County will continue to apply the Level of

Service (LOS) analysis or other traditional metrics to determine traffic impacts for operational level assessment as appropriate.

3. ***Sheriff/Fire/Paramedic:*** Adequate facilities and equipment, as determined through GMA Facility Implementation Plans developed in consultation with the Fire Authority and Sheriff Department, shall be financed and implemented in a manner that ensures that the costs of necessary facilities and equipment for new development are borne by new development. The service levels established in the GMA Facility Implementation Plans shall be, at a minimum, equivalent to those service levels specified in the General Plan.

4. ***Library Facilities:*** Adequate facilities and equipment, as determined through GMA Facility Implementation Plans, shall be financed and implemented consistent with a general service standard of one 10,000 square-foot branch library facility per 50,000 residents, or if appropriate, one 15,000 square-foot regional library per 75,000 residents.

Policies

1. ***DEVELOPMENT PHASING***

Development shall be phased in accordance with any applicable Comprehensive Phasing Plan (CPP) adopted by the County. It is the intent that such CPPs shall include development phasing plans which establish both a phasing allocation of development commensurate with roadway and public facility capacities and an overall build-out development plan which can be supported by implementation of the planned infrastructure system.

2. ***BALANCED COMMUNITY DEVELOPMENT***

Balanced community development shall be established which encourages employment of local residents and provides for both employment and employee housing opportunities within the County or Growth Management Area except in "Transition Areas for Rural Communities" which may be established pursuant to this Element or where a Specific Plan or Feature Plan dictates otherwise. In particular, SB 743 updates the way transportation impacts are measured in California Environmental Quality Act (CEQA) review for new development projects. This change will help us achieve our climate commitments, preserve our environment, improve our health and safety, particularly for our most

The County maintains over 1,060 lane-miles of unincorporated roadways.

vulnerable residents, and boost our economy by prioritizing co-located jobs, services, and hosing.

3. TRAFFIC LEVEL OF SERVICE POLICY

It is the policy of the County that within three years of the issuance of the first use and occupancy permit for a development project or within five years of the issuance of a finished grading permit or building permit for said development project, whichever occurs first, that the necessary improvements to arterial highway facilities, to which the project contributes measurable traffic, are constructed and completed to attain Level of Service (LOS) "D" at the intersections under the sole control of the County. LOS "C" shall also be maintained on Santiago Canyon Road links until such time as uninterrupted segments of the roadway (i.e., no major intersections) are reduced to less than three miles.

Intersections exempt from the above paragraph include facilities under the jurisdiction of a city or the State or those included on the Deficient Intersection List established pursuant to this Element. However, it is the policy of the County that all development contributing measurable traffic to intersections on the Deficient Intersection List shall only be approved if the development project contributes on a pro-rata basis to a Deficient Intersection Fund.

The "County of Orange Growth Management Element Transportation Implementation Manual" which was adopted by the Board of Supervisors in June 1989 and, as may subsequently be amended, establishes the procedures and local parameters for the implementation of this policy. Amendments to the manual shall be approved by the Board of Supervisors only after a public hearing. Since then, the Transportation Implement Manual was deleted from the County of Orange General Plan Transportation Element and serves as a stand-alone "2020 Updated Transportation Implemental Manual".

4. VECHILE MILES TRAVELED POLICY

Statewide implementation for SB 743 began July 1, 2020. SB 743 changed the way transportation studies are conducted in CEQA documents. Vehicle miles traveled (VMT) replaces motorist delay and level of service (LOS) as the metric for impact determination. For land development projects, VMT is the product of the daily trips generated by a new development and the distance those trips travel to their destinations. For capital projects, impacts are identified as the new VMT attributable to the new capital project, both from the installation of the facility and the induced growth generated as a result of induced land use.

The "2020 Updated Transportation Implementation Manual", which was

adopted by the Board of Supervisors in 2020, may subsequently be amended, establishes the procedures and local parameters for the implementation of this policy.

54. TRAFFIC IMPROVEMENT PROGRAMS

Comprehensive traffic improvement programs shall be established to ensure that all new development provides necessary transportation facilities and intersection improvements as a condition of development approval. Participation in such programs shall be on a pro-rata basis and shall be required of all development projects except where an increased level of participation exceeding these requirements is established through negotiated legal mechanisms, such as a public facilities development agreement.

65. PUBLIC FACILITY PLANS

Comprehensive public facility plans shall be established for fire, sheriff/police and library facilities. All development projects shall participate in such plans on a pro-rata basis and as a condition of development approval except where an increased level of participation exceeding these requirements is established in negotiated legal mechanisms, such as a public facilities development agreement.

76. TRANSITION AREAS FOR RURAL COMMUNITIES

New development within the Silverado-Modjeska Specific Plan planning area (Adopted by the Orange County Board of Supervisors August 31, 1977, Resolution No. 77-1436) and Foothill Trabuco Specific Plan (Adopted December 19, 1991, Ordinance 91-698513) shall be rural in character and shall comply with the policies of that plan in order to maintain a buffer between urban development and the Cleveland National Forest.

It is recognized that additional plans may be established which provide a transition area between urban development and major open space areas.

87. BUFFER ZONES

There shall be buffer zones established through Feature Plans, Specific Plans, and/or Scenic Corridor Plans which provide for the physical separation of major communities by means of open space areas/corridors. Said open space area/corridors will be based upon natural features such as creeks or prominent topographic or aesthetic features.

It is recognized that the buffer zones established pursuant to this policy will not necessarily link Regional Parks or serve a recreational function.

IMPLEMENTATION PROGRAMS

The County's Growth Management Element was used as a model for Measure M local requirements.

1. PARTICIPATION IN INTER-JURISDICTIONAL PLANNING FORUMS

As required by Measure M, the County shall participate in the Inter-Jurisdictional Planning Forums (IJPFs) at the GMA level to examine regional improvements needed within the GMA. Each IJPF annually develops a prioritized list of transportation improvement projects, which is approved by the IJPF's elected officials and submitted to the Orange County Transportation Authority for funding consideration. The County will participate in development of the annual GMA Transportation Improvement Project List for each GMA.

2. COMPREHENSIVE FACILITIES IMPLEMENTATION PLANS

The County shall maintain Comprehensive Facility Implementation Plans, incorporating both Traffic Improvement Programs and Public Facilities Plans, for the financing of transportation, police/sheriff, fire, and library facilities for each GMA which includes major unincorporated areas in accordance with the goals, objectives, and policies of this Element. The adopted Foothill Circulation Phasing Plan (FCPP) shall be utilized as a model for these plans. The FIPs shall serve to implement the development phasing plan allocations set forth in the Development Phasing Policy of the Goals, Objectives and Policies section.

The Comprehensive Facilities Implementation Plans will include a flood control component. Said component will either provide a drainage master plan for the GMA or incorporate the provisions of a drainage master plan for a larger area.

The flood control component shall be consistent with guidelines developed by Public Facilities and Resources Department. These guidelines will ensure that the flood control components each include common elements, specifically:

1) Plans for each drainage area or sub-unit;

2) An assessment of drainage design constraints early in the planning process;

3) An assessment of drainage design constraints or opportunities caused as a result of watershed area being under one owner or multiple owners;

4) Utilization of the Orange County Hydrology Manual; and

5) A plan for financing necessary improvements.

In addition, the FIPs shall include a community design concept and

implementing timeline for establishing design standards for commercial and industrial development in the planning area.

3. MEASURE M COUNTYWIDE GROWTH MANAGEMENT PROGRAM

The County shall take all actions possible to ensure that the implementation of this Element is consistent with the provisions of the Measure M Countywide Growth Management Program in order to bring about improved regional coordination in the areas of growth management, traffic improvement, and public service delivery.

4. PERFORMANCE MONITORING PROGRAM

The Performance Monitoring Program shall continue to provide an annual evaluation of compliance with development phasing allocations established pursuant to Development Phasing as described in the Goals, Objectives and Policies section. This program shall also ensure that necessary road and other public facilities improvements or funding are actually provided in order for development to continue. If the necessary improvements/funding are not provided, development shall be deferred until compliance with the provisions of this program is achieved.

In addition, the Performance Monitoring Program will provide an annual evaluation of the maintenance of service levels. The traffic reports provided under this program shall utilize data collected within three (3) months of preparation of the report, unless otherwise directed by the County Traffic Engineer. In the event that the Performance Monitoring Program identified one or more service level deficiencies, corrective measures shall be implemented by the County to address the identified deficiencies.

5. TRAFFIC IMPROVEMENT/ PUBLIC FACILITY DEVELOPMENT AGREEMENTS

In the event the financing and implementation provisions of this Element are implemented through subsequent, legally valid Traffic Improvement/ Public Facility Development Agreements, said agreements shall be consistent with the County's Growth Management Program and its implementing ordinances, plans, and programs.

6. ADDITIONAL IMPLEMENTATION PROGRAMS

Other implementing measures, as deemed necessary by the County to further the goals of this Element, may be established.

Attachment 7

2020 UPDATED TRANSPORTATION IMPLEMENTATION MANUAL

COUNTY OF ORANGE

OC PUBLIC WORKS

OC INFRASTRUCTURE PROGRAMS

FINAL DRAFT

2020 UPDATED TRANSPORTATION IMPLEMENTATION MANUAL

COUNTY OF ORANGE

OC PUBLIC WORKS

OC INFRASTRUCTURE PROGRAMS

Adopted by the Orange County Board of Supervisors

March 15, 1994

Amended October 2, 2012 (Reso. No. 12-148)

Amended Month Date, 2020 (Reso No. 20-xxx)

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LIST OF ATTACHMENTS

CHAPTER 1 - INTRODUCTION

The Transportation Implementation Manual is intended to clarify the intent of the "Traffic Level of Service Policies" of the Growth Management (GM) Element. The manual describes how the "Traffic Level of Service Policies" of the GM Element are to be implemented on a site or project specific basis. It includes a listing of projects which are exempt from GM Element traffic requirements, acceptable traffic analysis methodologies, minimum requirements of GM traffic reports, and the traffic monitoring surveys the County will conduct to determine system performance.

This manual and the provisions contained in the GM Element apply to Santiago Canyon Road and the Circulation Plan intersections under the sole control of the County.

CHAPTER 2 – DEFINITIONS

In addition to those terms defined in the GM Element, for the purposes of this manual, the following terms are defined below:

A. CRITICAL MOVEMENT: In the case of signalized intersections, any of the conflicting through or turning movements which determine the allocation of green signal time. In the case of Santiago Canyon Road, that direction of any two way peak hour flow which is greater.

B. DEFICIENT INTERSECTION FUND (DIF): A trust fund established to collect fees and implement the maximum improvements deemed feasible by the County to existing signalized intersections which do not meet the Traffic Level of Service Policy for reasons beyond the County's control. All projects contributing measurable traffic to intersections on the Deficient Intersection List shall contribute to this fund on a pro-rata basis.

C. DEFICIENT INTERSECTION LIST (DIL): A list of intersections within the jurisdiction of the County which currently do not meet the Traffic Level of Service Policy for reasons which are beyond the control of the County (e.g., ramp metering effects, traffic generated outside the County's jurisdiction, etc.), and where there are seemingly no opportunities for making any conventional geometric improvement within the current seven-year "measure M" Growth Management Program's Capital improvement Program which will achieve the LOS standards. The current list is included as Section VI of this manual. Additional intersections may be added by the County only as a result of conditions which are beyond the control of the County and after a public hearing.

D. EXEMPT INTERSECTION: An unsignalized intersection or an intersection not under the sole control or jurisdiction of the County of Orange or on the Deficient Intersection List.

E. LEVEL OF SERVICE (LOS): A measure of the operational quality of a road or intersection ranging from Level of Service A (best) to Level of Service F (worst).

F. MAXIMUM FEASIBLE INTERSECTION (MFI): The maximum condition an existing intersection may be widened or improved to, while still providing reasonable operational characteristics, given the nature of the surrounding land use. The MFI concept will apply specifically to the DIL and the determination will be made by the County.

G. MEASURABLE TRAFFIC: A traffic volume resulting in a 1% increase in the volume/capacity ratio of the sum of all critical movements.

Example: If the V/C of an intersection is 0.860, measurable traffic will be any addition of trips which will raise the V/C to 0.860+ (0.01 x 0.860), i.e., 0.869. For an intersection operating at V/C = 0.860 (C= 1700), measurable traffic would then be any increase in traffic which adds (0.869 - 0.860) x 1700 = 15.3 or 15 or more vehicles to the critical movements.

H. SPHERE OF IMPACT: That area to which a project contributes measurable traffic.

I. TRAFFIC LEVEL OF SERVICE POLICY: Within three years of the issuance of the first use and occupancy permit for a development project or within five years of the issuance of a finished grading permit or building permit for said project, whichever occurs first, all necessary improvements to the highway system within the County's jurisdiction to which the project contributes measurable traffic shall be constructed and completed to attain Level of Service (LOS) "D" or better. LOS "C" shall be maintained on all uninterrupted links of three miles in length or more on Santiago Canyon Road until such time as uninterrupted segments (i.e. between major signalized intersections) are reduced to less than three miles.

CHAPTER 3 – PROJECTS EXEMPT FROM THE GM REQUIREMENTS

The following development projects have been deemed to have significant public benefit or little traffic impact and are exempt from the requirements of the GM Element:

A. Any development on an existing lot resulting in a total daily traffic generation of less than 200 trips. The following amounts of land use will each generate 200 trips. For other land uses, see "Daily Vehicle Trip Generation Rates" prepared by Orange County.

Multifamily residential	29 Dwelling Units
Single Family Detached	17 Dwelling Units
Single Family Detached-Estate	13 Dwelling Units
Mobile Home	40 Dwelling Units
Light Industrial	15,400 square feet
Hotel/Motel	20 Rooms
General Office	13,300 square feet
Medical Office	2,600 square feet
Neighborhood Commercial	1,480 square feet
Convenience Market	360 square feet
Fast Food Restaurant	222 square feet

B. Any agricultural, open space, conservation, or passive park use.

C. Any rebuilding of an existing development damaged or destroyed by fire or natural disaster if uses and square footage remain substantially the same.

D. Public health & safety facilities such as hospitals, police, fire & safety facilities, and schools.

E. Government-owned facilities or utilities shall be exempt to the extent the facilities will not be used for generating revenue or commercial purposes. Examples of exempt public uses are city halls, park buildings, and other public buildings. Privately

owned utilities will not be exempt from growth management requirements. Notwithstanding property tax exemptions, governmental-owned or constructed facilities (including but not limited to counties, cities and redevelopment agencies) which will generate revenue or be leased for commercial purposes shall be required to prepare the necessary reports and mitigate impacts as appropriate. Examples of this include the revenue generating portions of airports, train stations, stadiums, sports arenas, convention centers, bus terminals, hotels,
or concessions on public lands.

F. Minor alterations and remodeling of existing structures resulting in no substantial change in traffic generation as determined by the Director, OC Public Works or designee.

G. Places of worship, colleges, welfare, etc. to the extent such facilities are exempt from property tax levies.

CHAPTER 4 – TRAFFIC ANALYSIS METHODOLOGIES

There are a wide variety of traffic analysis methodologies available to traffic engineers. They range from specific procedures required by individual municipalities to standardized techniques used nationwide. In order to ensure all GM Element analyses are consistent, accurate, and generally reproducible, the County of Orange has adopted a set of procedures and acceptable methodologies that are representative of travel behavior in Southern California. For the analysis of GM Element traffic impacts at intersections, the County of Orange requires that the Intersection Capacity Utilization (ICU) methodology be used.

This manual assumes traffic engineers are familiar with the analysis techniques and need only be provided with the necessary assumptions regarding flow rates, clearance times, adjustment factors, etc., to calculate level of service.

The following is a list of the assumptions to be used for GM Element intersection analysis. Any individuals attempting a GM Element traffic analysis without a full understanding of the procedure or assumptions are urged to contact RDMD/Transportation Review Section for clarification prior to performing any work.

A. LEVELS OF SERVICE

The Level Of Service (LOS) of a signalized intersection shall be based upon the sum of the volume-capacity ratios (V/C) of the critical movements. The County's definition of the overall LOS of an intersection is as follows:

Level Of Service	V/C Range
A	0.00 - 0.60
B	0.61 - 0.70
C	0.71 - 0.80
D	0.81 - 0.90
Level Of Service	V/C Range
E	0.91 - 1.00
F	1.00+

B. FLOW RATES AND ADJUSTMENT FACTORS

The saturation flow rate for intersections (also known as lane capacity) shall be 1700 vehicles per hour of green time per lane. This rate is the result of research done on intersections in Orange County during peak periods. This rate may be utilized on left, through, and right turn lanes. Generally, no adjustment will be necessary for dual left turn lanes. However, the County reserves the right to require the use of adjustment factors where, in the County's opinion, unusual conditions exist. In these cases, the adjustment factors for such items as lane width, trucks, grade, or pedestrian activity shall be as stated in the 1997 "Highway Capacity Manual" or any subsequent revisions.

C. LOST TIME

Lost time (also known as "yellow time" or "clearance interval" in some analyses) is given a value of 0.05 (five percent) in GM analyses.

D. LANE DISTRIBUTION

In most cases, approach traffic may be assumed to be distributed evenly among all lanes serving a given movement (i.e., left, through, or right). An exception to this may occur in the case of split signal phasing which is further discussed below. In certain locations where unusual attractions may occur such as a freeway ramp entrance or entrance to a shopping center, an unusually skewed distribution may occur. In such cases, the County shall specify the distribution to be used.

E. RIGHT TURNING TRAFFIC

If the distance from the inside edge of the outside through travel lane is at least 19 feet and no observable parking demand exists during the peak period, or parking is prohibited, right turning vehicles may be assumed to utilize this "unofficial" right turn lane. Otherwise, all right turn traffic shall be assigned to the outside through lane. If an exclusive right turn lane exists and right turn on red is permitted at that location, a 15 percent increase in capacity of the right turn lane may be assumed. If a free right turn exists (right turns do not have to stop for the signal) a flow rate of 1700 vehicles per hour may be assumed for it. The analysis shall account for all right turning traffic, none shall be ignored. Any need for signal overlaps shall be clearly stated.

F. SIGNAL PHASING

At some intersections, split signal phasing may exist. At such locations optional through/left or through/right lanes may be present. Any analysis done for these situations must reflect the true distribution of the approach traffic into these optional lanes. This type of operation is often more difficult to analyze and additional care should be taken to ensure correct results.

G. SANTIAGO CANYON ROAD

For Growth Management Element traffic analyses of Santiago Canyon Road, the traffic level of service policy shall be implemented by evaluating peak hour volumes in relation to the physical capacity of the roadway, using the Volume-to-Capacity methodology. A lane volume of 1,360 vehicles per hour, which is 0.80 times the maximum directional lane capacity of 1,700 vehicles per hour, represents Level of Service "C". These lane capacity guidelines shall be used to ensure that the Level of Service "C" capacity of 1,360 vehicles per hour per lane will be maintained.

CHAPTER 5.0 – MINIMUM REQUIREMENTS OF GM ELEMENT TRAFFIC ANALYSIS

In order to ensure adequate information is provided to the County to judge the impacts of new development, the following minimum requirements are set forth for all traffic analyses of GM Element traffic impacts. While the County does not seek to cause preparation of volumes of unnecessary reports, each application must pass a test of timeliness and content. Reports prepared at earlier levels of review may be used only if the information they contain is still representative of the project under consideration.

A. GENERAL

The report shall be prepared by, or under the supervision of, a Traffic Engineer registered by the State of California. The report shall bear the stamp of the responsible Traffic Engineer. No report shall be accepted for review if it does not bear the appropriate signature, stamp and expiration date. The report shall be divided into the following sections:

1. Project Description
2. Existing Conditions
3. Future Conditions
4. Project Trip Generation
5. Project Trip Distribution
6. Intersection Analysis
7. Santiago Canyon Road Analysis (if applicable)
8. Summary of Impacts
9. Mitigation

The following is an elaboration of each section describing in more detail what should be covered.

1. PROJECT DESCRIPTION

The project should be clearly described, stating the acreage, number of units or gross and net floor area, points of access, and planned usage. A location map should be included

showing the project's relationship to the regional and local circulation systems. A feature plan, plot plan or site plan showing detail commensurate with the level of approval sought, including all pertinent transportation elements (e.g. arterials, streets, access locations, parking, driveways, etc.) must be part of the project description.

2. EXISTING CONDITIONS

All existing traffic conditions within the project's sphere of impact must be clearly described and presented in a graphical manner. Base condition traffic volumes, levels of service, critical movements, and Deficient Intersections will be available from the County. Tabular presentations may be used in addition to the graphical displays. These include:

- AM and PM peak hour, and daily traffic volumes.
- AM and PM peak level of service of all signalized intersections and identification of all critical movements.
- Deficient intersections.

3. FUTURE CONDITIONS

The future conditions within the project's sphere of impact shall be described in a graphical manner consistent with the level of entitlements for project plus existing, and project plus an interim year projection as directed by the County. In addition, a buildout evaluation to establish general plan consistency when appropriate will be required. The County will direct and assist the project applicant to establish the necessary background volume projections.

The traffic projections shall be based upon the level of information available for the levels of service of all signalized intersections will be presented. Any planned road or intersection improvements scheduled within the upcoming five years time included in the analysis shall be described and accounted for in the analysis.

4. PROJECT TRIP GENERATION

The AM and PM peak hour and daily total traffic generation of the project shall be calculated using rates as specified by the County of Orange. In the event a land use is proposed for which no reliable generation rate is available from the County, the generation rate used may be derived from independent empirical studies subject to approval by the County. If the proposed project contains mixed land uses (such as commercial, residential, office or industrial) resulting in expected trips wholly internal to the project, the percentage of internal trips shall be approved by the County prior to proceeding with the analysis.

5. PROJECT TRIP DISTRIBUTION

The project's trip distribution shall be presented in graphical form showing both the number of trips generated by the project and the percentage of the project's total generation on each arterial link to the limit of the project's sphere of impact. In the case of a project containing mixed land uses, a separate distribution shall be presented for each land use, in addition to the summation of the individual distributions.

6. INTERSECTION ANALYSIS

Any intersection to which the project contributes measurable traffic, either in the present or in the interim year projections, must be further analyzed using the methodologies previously discussed. The levels of service for such impacted intersections shall be calculated and reviewed to determine if any mitigation is required under the conditions of the GME.

If a project contributes measurable traffic to a Deficient Intersection, the analysis should show the project's total daily traffic contribution to the Deficient Intersection as well as the total traffic entering that intersection.

7. SANTIAGO CANYON ROAD ANALYSIS

Projects which increase the existing (at the time the project is proposed) critical movement (the higher of the two directional movements) by one percent or more during the AM or PM peak hour on Santiago Canyon Road shall perform a level of service analysis using the previously specified methodology. The analysis shall address project

plus existing, project plus an interim year projection, as determined by the County, in addition to buildout analyses required for general plan consistency evaluation.

8. SUMMARY OF IMPACTS

The report shall contain a listing of all adverse impacts created by the project. These include intersections presently operating at better than LOS D and projected to operate at worse than LOS D as a result of the project, intersections already operating at LOS D to which additional traffic is added by the project, and traffic added to Deficient Intersections.

9. MITIGATION MEASURES

If mitigations are required, their implementation feasibility shall be determined. It is important to classify which mitigations:

- are solely in the control of the project proponent (such as widening adjacent to the proposed project);
- require approval of others or participation in a program (such as FCPP intersection widenings) or intersections within other jurisdictions or shared with them);
- require participation or regulatory action on the part of the County (such as prohibiting parking for intersection restripings);
- require development participation in mitigation cost (see attachment A).

The last section of the report shall contain a detailed description of mitigation measures proposed by the project. A list of these measures shall also be included in a summary at the beginning of the report. The rough cost estimates and potential funding sources of all the mitigation measures (either within the County or outside the County's jurisdiction) shall be provided in the report.

CHAPTER 6.0 – DEFICIENT INTERSECTION LIST

A. GENERAL

A deficient intersection is one that is under the sole control of the County which is currently operating at worse than LOS "D" as a result of factors outside the control of the County and where there are seemingly no opportunities for making any conventional geometric improvements within the current seven-year measure "M" Growth Management Program's Capital Improvement Program (CIP). Each intersection must be studied to determine the Maximum Feasible Intersection (MFI) that could be reasonably expected to be built at the location if funding were available. This will serve as the basis for a cost estimate and the associated fee to be paid by development which contributes measurable traffic to the intersection. The MFI is anticipated to be an at-grade intersection for purposes of this analysis.

As part of the MFI study for each of the intersections on the Deficient Intersection List, the County will prepare cost estimates to modify the existing intersection to its MFI configuration. Any non-exempt development contributing measurable traffic to an intersection on the Deficient Intersection List shall contribute to the Deficient Intersection Fund in an amount equal to the amount of the project's traffic entering the intersection divided by the total traffic entering the intersection as measured in the 1990 Baseline traffic counts, multiplied by the estimated cost to improve the intersection to its MFI condition as shown below:

(Project Traffic I 1990 Baseline Traffic Volume) x (Total Improvement Cost)

The collected fees could be spent on either the deficient intersection or alternative mitigation measures that will relieve congestion on the impacted deficient intersection(s).

B. DEFICIENT INTERSECTIONS

There are no deficient intersections at this time.

C. PROCEDURE TO MODIFY DEFICIENT INTERSECTIONS LIST

Any additional intersections may be placed on the Deficient Intersection List through a noticed public hearing by the Board of Supervisors. The Board will be asked to make specific findings with respect to intersections proposed for inclusion on or exclusion from the list.

Those findings will require that:

1. The intersection operates at level of service E or F as defined by the County traffic level of service policy.
2. The contribution to the critical movement(s) which determines the level of service at the intersection is a direct result of actions or factors over which the County has no control (e.g., ramp metering, adverse signal timing by state or neighboring city, city trip generation which uses County roadways as primary access routes, emergency services activities, etc.). Such contribution shall be identified by traffic counts and origin/destination data as appropriate.
3. The intersection has been annexed or incorporated and is no longer within unincorporated County area.

Removal of an intersection from the Deficient Intersection List requires the Board of Supervisors find that one of the three above conditions no longer exists and is not expected to resume.

CHAPTER 7.0 –COUNTRY TRAFFIC MONITORING PROGRAM

In addition to the County's administration of the GME, the County will be an active participant of the GME by providing base condition traffic counts and levels of service. The County will also make available forecasts as part of the Development Monitoring Program (DMP).

Biennially; from January through April, the OCPW/ Infrastructure Programs/Traffic and Development Support will take AM and PM peak hour turning movement counts at all intersections that may be considered by the GME. These will be analyzed to determine the base level of service and critical movements for the upcoming calendar year.

The OCPW/ Infrastructure Programs/Traffic and Development Support will also take 24 hour directional traffic counts on Santiago Canyon Road. Due to the sensitivity of this road and the rapidly increasing traffic volumes, counts will be taken every six months, in April and October. After completion of all traffic counts, they will be incorporated into the County's latest Development Monitoring Report each January. The DMP will include existing volumes and levels of service and projections of traffic volumes and levels of service for an interim period from present. It is from this basis project proponents should proceed with their analyses of the traffic impacts of their projects.

CHAPTER 8.0 –VEHICLE MILES TRAVELED

This section is intended to serve as a guide, along with the Guidelines for Evaluating Vehicle Miles Traveled Under CEQA prepared by LSA Associates, Inc. (August 2020), for application of Vehicle Miles Traveled (VMT) in CEQA documents. This section describes how VMT is to be implemented on a site or project specific basis, and is modeled after the Governor's Office of Planning and Research (OPR) Technical Advisory (TA) on Evaluating Transportation Impacts in CEQA. The County will continue to use Level of Service (LOS) or another traditional metrics to ensure conformity with County planning documents and policies. Also, as in previous CEQA practice, the applicant/project proponent will still be required to provide traffic analysis that is specific to the proposed project to be reviewed and approved by the County.

These guidelines apply to all projects for which the County is the Lead Agency for certification or adoption of CEQA documents. If the County is the Lead Agency, but the project is located in another jurisdiction, these guidelines would apply. However, if the County is not the Lead Agency, and the project is located in another jurisdiction, the Lead Agency would determine which VMT guidelines should be used for analysis.

A. DEFINITION OF REGION

The "region" for Orange County is the entire county area.

According to the Orange County Transportation Analysis Model (OCTAM 5.0), of the total trips in and out of Orange County, about 21 percent originate and are destined within the unincorporated county area. Another 67 percent of trips originate or are destined within the municipal jurisdictions (cities) in Orange County. The remaining 12 percent of Orange County trips have a trip end in the other counties of the SCAG region or beyond. Because the majority of the unincorporated county trips are contained within the entirety of Orange County (approximately 88 percent) and many other large urbanized areas are defining their region as their counties, the use of Orange County in its entirety is defined as the region for CEQA land development transportation analyses.

It should be recognized the use of Orange County as the region defines the comparative (i.e., baseline), or the denominator, in the identification of project-related impact. The

numerator is the project's VMT contribution. The project-related/generated VMT profile may go beyond the county boundary and not be truncated by a jurisdictional boundary.

VMT is a regional effect not defined by roadway, intersection, or pathway. The OPR acknowledges that lead agencies should not truncate any VMT analysis because of jurisdictional or other boundaries by failing to count the portion of a trip that falls outside the jurisdiction or by discounting the VMT from a trip that crosses a jurisdictional boundary. In that case, it would be the responsibility of the applicant and their traffic study consultant to include the project VMT, regardless of geographical limit. To the satisfaction of County staff. The project-related VMT profile would be compared against the County regional baseline.

B. PROJECT SCREENING

Certain activities and projects may result in a less than significant impact to transportation and circulation. A variety of projects may be screened out of a VMT analysis as follows:

1. LAND DEVELOPMENT PROJECTS

The OPR TA and Guidelines for Evaluating Vehicle Miles Traveled Under CEQA (August 2020) acknowledges that conditions may exist under which a land development project would have a less than significant impact on transportation and circulation. These may be size, location, proximity to transit, or trip-making potential.

Land development projects that have one or more of the following attributes may be presumed to create a less than significant impact on transportation and circulation.

- **Project in High-Quality Transit Area (HQTA):** The project is within 0.5 mile (mi) of a Transit Priority Area (TPA) or an HQTA, unless the project is inconsistent with the RTP/SCS, has a floor to-area ratio (FAR) less than 0.75, provides an excessive amount of parking, or reduces the number of affordable residential units. In accordance with SB 743, "Transit Priority Areas" are defined as "an area within one-half mile of a major transit stop that is existing or

planned, if the planned stop is scheduled to be completed within the planning horizon included in a Transportation Improvement Program. A Major Transit Stop means: "a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service of 15 minutes or less during the morning and afternoon peak commute periods." An HQTA or Corridor is a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.

Figure 4 of the Guidelines for Evaluating Vehicle Miles Traveled Under CEQA prepared by LSA Associates, Inc. (August 2020) depicts TPAs within unincorporated Orange County1, including HQTA corridors served by the Orange County Transportation Authority with service intervals of 15 minutes or less and major transit stops along the Metrolink2 system. Although the figure shows the San Clemente Pier Metrolink station, it does not qualify as a major transit stop because service is limited to weekends. Projects proposed in these areas would be presumed to have a less than significant transportation impact unless the project is inconsistent with the RTP/SCS, has an FAR less than 0.75, provides an excessive amount of parking, or reduces the number of affordable residential units.

- **Neighborhood Retail Project:** The project involves local-serving retail space of less than 50,000 square feet.
- **Affordable Housing Project:** The project is 100 percent affordable-housing units.
- **Low VMT Area[1] Project:** The project is in low VMT areas. The applicant may submit data from the most recent OCTAM version showing the proposed project is within a low VMT area, which may be used, at the discretion of staff, to screen out the project.

[1] Orange County's land area may be described in terms of low, medium and high VMT areas based on thresholds described in Chapter 4. These descriptions are Low: less 85 percent of the regional average; Medium: equal to or more than 85 percent of the regional average and less than or equal to 117 percent of regional average; and High: greater than 117 percent of regional average.

- **Small Project:** A project generates 500 or fewer average daily trips (ADT). The TA recommends a volume of 110 ADT as the low volume that would allow the project to be screened out. This recommendation is not based on any analysis of GHG reduction, but was instead based on the potential trip generation of an office project that would already be categorically exempt under CEQA. LSA prepared a deeper analysis and used the California Emissions Estimator Model (CalEEMod, version 2016.3.2) to correlate the effect of changes in project-related ADT to the resulting GHG emissions. This model was selected because it is provided by the California Air Resources Board (CARB) to be used statewide for determining project-level GHG emissions. CalEEMod was used with the built-in default trip lengths and types to show the vehicular GHG emissions from incremental amounts of ADT. Table 3 of the Guidelines for Evaluating Vehicle Miles Traveled Under CEQA (August 2020) shows the resulting annual VMT and GHG emissions from the incremental ADT.

  A common GHG emissions threshold is 3,000 metric tons (MT) of carbon dioxide equivalent[2] (CO2e) per year. Vehicle emissions are typically more than 50 percent of the total project GHG emissions. Thus, a project with 500 ADT would generally have total project emissions that could be less than 1,300 MT CO2e/year (i.e., 50 percent or 643 MT CO2e/year coming from vehicle emissions and the other 50 percent coming from other project activities). As this level of GHG emissions would be less than 3,000 MT CO2e/year, the emissions of GHG from a project up to 500 ADT would typically be less than significant.

  Based on this qualitative analysis, the County establishes a screening criteria for small projects of up to 500 ADT.

- **Public Facilities:** The development of institutional/government and public service uses that support community health, safety or welfare are also screened from subsequent CEQA VMT analysis. The following includes some examples and

[2] Carbon dioxide equivalent (CO2e) is a concept developed to provide one metric that includes the effects of numerous GHGs. The global warming potential (GWP) of each GHG characterizes the ability of each GHG to trap heat in the atmosphere relative to another GHG. The GWPs of all GHGs are combined to derive the CO2e.

is not an exhaustive list of public facilities that are screened from subsequent CEQA VMT analysis: police/sheriff stations, fire stations, community centers, refuse stations, jails, and landfills. These facilities are already part of the community and, as a public service, the VMT is accounted for in the existing regional average. Many of these facilities also generate fewer than 500 ADT and/or use vehicles other than passenger-cars or light duty trucks. These other vehicle fleets are subject to regulation outside of CEQA, such as the California Air Resources Board (CARB) and the South Coast Air Quality Management District.

2. TRANSPORTATION PROJECTS

The primary attribute to consider with transportation projects is the potential to increase vehicle travel. While the County has discretion to continue to use delay analysis for CEQA disclosure of transportation projects, changes in vehicle travel must also be quantified.

The OPR TA and Guidelines for Evaluating Vehicle Miles Traveled Under CEQA (August 2020) also lists a series of projects that would not likely lead to a substantial or measurable increase in vehicle travel and that, therefore, would generally not require an induced travel analysis. The current list of projects, includes but not limited to are the following examples:

- Rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets (e.g., highways; roadways; bridges; culverts; Transportation Management System field elements such as cameras, message signs, detection, or signals; tunnels; transit systems; and assets that serve bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity
- Roadside safety devices or hardware installation such median barriers and guardrails
- Roadway shoulder enhancements to provide “breakdown space,” dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes

- Addition of an auxiliary lane of less than one (1) mile in length designed to improve roadway safety
- Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left-, right-, and U-turn pockets, two-way left-turn lanes, or emergency breakdown lanes that are not utilized as through lanes
- Addition of roadway capacity on local or collector streets, provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit
- Conversion of existing general-purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel
- Addition of a new lane that is permanently restricted to use only by transit vehicles
- Reduction in the number of through lanes
- Grade separation to separate vehicles from rail, transit, pedestrians, or bicycles, or to replace a lane in order to separate preferential vehicles (e.g., high-occupancy vehicles [HOVs], high occupancy toll [HOT] lane traffic, or trucks) from general vehicles
- Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features
- Installation of traffic metering systems, detection systems, cameras, changeable message signs, and other electronics designed to optimize vehicle, bicycle, or pedestrian flow
- Timing of signals to optimize vehicle, bicycle, or pedestrian flow
- Installation of roundabouts or traffic circles
- Installation or reconfiguration of traffic calming devices •
- Adoption of or increase in tolls
- Addition of tolled lanes, where tolls are sufficient to mitigate VMT increase
- Initiation of a new transit service
- Conversion of streets from one-way to two-way operation with no net increase in the number of traffic lanes
- Removal or relocation of off-street or on-street parking spaces

- Adoption or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)
- Addition of traffic wayfinding signage
- Rehabilitation and maintenance projects that do not add motor vehicle capacity
- Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way
- Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve nonmotorized travel which provide completely separated rights-of-way (Streets and Highway Code, Division 1, Chapter 8, Article 3, Section 890.4).
- Installation of publicly available alternative fuel/charging infrastructure
- Addition of passing lanes, truck climbing lanes, or truck brake-check lanes in rural areas that do not increase overall vehicle capacity along the corridor

Additionally, transit and active transportation projects generally reduce VMT and are, therefore, presumed to cause a less than significant impact on transportation. This presumption may apply to all passenger rail projects, bus and bus rapid-transit projects, and bicycle and pedestrian infrastructure projects.

C. SIGNIFICANCE THRESHOLDS FOR LAND DEVELOPMENT PROJECTS

The TA states that SB 743 and all CEQA VMT transportation analyses refer to automobiles. Here, the term automobile refers to on-road passenger vehicles, specifically cars and light-duty trucks. Heavy-duty trucks can be addressed in other CEQA sections and are subject to regulation in a separate collection of rules under CARB jurisdiction.

The OPR has identified the subject of the thresholds as the primary trips in the home-based typology: specifically, home-based work trips. This includes residential uses, office uses, and retail uses. The home-based work trip type is the primary tripmaking during the peak hours of commuter traffic in the morning and evening periods.

The focus of analyzing transportation impacts has shifted from congestion to climate change, and the purpose of the CEQA analysis is to disclose and ultimately reduce GHG emissions by reducing the number and length of automobile trips. This change in CEQA analysis does not diminish the County's ability to require an LOS analysis to confirm accessibility to a project site, conformance with General Plan policies, or as a function of their general health, safety, and welfare discretion and authority. As part of the SB 375 land use/transportation integration process and the GHG goal setting, most metropolitan planning organizations and regional transportation planning agencies have agreed to reduce GHG through integrated land use and transportation planning by approximately 15 percent by 2035. Furthermore, in its 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals, the CARB recommends total VMT per capita rates approximately 15 percent below existing conditions.

The TA therefore recommends:

> *A proposed (residential) project exceeding a level of 15 percent below existing regional average VMT per capita may indicate a significant transportation impact.*
>
> *A similar threshold would apply to office projects (15 percent below existing regional average VMT per employee).*
>
> *VMT generated by retail projects would indicate a significant impact for any net increase in total VMT.*

While regional planning documents such as the RTP/SCS calculate a single VMT rate by dividing total VMT for the SCAG region by the total service population, it should be noted that the TA identifies a different denominator for the residential and office comparison rates. If regional average VMT per capita and VMT per employee were calculated using the service population (population plus employment), the denominator would be the same, which would be inconsistent with the TA. Furthermore, using service population to calculate regional average rates would complicate future project analyses.

The environmental document for a proposed land use project will identify population for a residential project and employment for an office project. These values should be used in the transportation analysis to calculate the project's VMT per capita or VMT per employee. If a project's VMT per capita (VMT/project population) or VMT per employee (VMT/project employment) is compared to a regional average based on service rate (VMT/[regional population + employment]), the comparison is not equivalent.

According to the Orange County Transportation Authority calculations using OCTAM 5.0, the average VMT/capita in Orange County is 17.9. The average VMT/employee in Orange County is 24.1.

Mixed-use projects should be evaluated for each component of the project independently, or the County may use the predominant land use type for the analysis. Credit for internal trip capture should be accounted for. No discrete land use types other than residential, office, or retail are identified for threshold development in the TA.

The OPR TA suggests that the County may, but is not required to, develop thresholds for any other use. One approach is to review the County General Plan and/or Countywide Long-Range Transportation Plan (LRTP) and identify whether the implementation of the plan would result in a reduction of VMT and GHGs. If it does, the County may conclude the implementation of the plan, including all the other land use types to achieve the regional climate change goals. Therefore, consistency with the plan and no net change in VMT per employee is a rational threshold for the other land use types. This approach would require disclosure of substantial evidence, including the General Plan or LRTP findings, and other supporting traffic and air quality forecasting support.

In summary, the County's thresholds of significance for the following land uses are:

- **Residential:** 15 percent below existing regional average VMT per capita (17.9 X 0.85 = 15.2)
- **Office:** 15 percent below existing regional average VMT per employee (24.1 X 0.85 = 20.5)
- **Retail:** no net change in total VMT

- **Mixed Use**: consider each component of the project separately based on the threshold for residential, office, retail, etc. and take credit for internal capture
- **Other Land Uses:** no net change in VMT per employee if consistent with the General Plan or 15 percent below regional average if seeking a General Plan Amendment

Figure 5 of the Guidelines for Evaluating Vehicle Miles Traveled Under CEQA (August 2020) demonstrates the potential land development entitlement process to comply with the Guidelines related to VMT and transportation impacts. It provides the path from application filing through determination of impacts. It is presented as the standard process; each development application is considered unique and may create alternative or modified steps through the process. Each step that diverges from this standard process should be accompanied with substantial evidence demonstrating compliance with other climate change and GHG emission reduction laws and regulations.

Project VMT analysis

The first step is to identify the project land use type and the appropriate efficiency rate to use. If the project is residential, use the per capita (or residential population) efficiency rate. If the project is commercial office (or a similar trip generator), use the per employee efficiency rate. For retail projects, use the total VMT generated by the project. For mixed use projects, report each land use after generating trips, taking credit for internal trip capture, to arrive at the VMT. As an alternative, the predominant use may be reported for mixed-use projects. For all other uses, use the VMT per employee as the comparative.

1. Medium Project VMT Analysis

For medium-sized projects (projects generating less than 1,000 ADT) or those with one predominant use, the determination of project VMT may be identified manually as the product of the daily trip generation (land use density/intensity multiplied by the County-approved trip generation rates, usually the ITE Trip Generation Manual) and the trip length in miles for that specific land use. Trip lengths can be found in other related air quality tools, such as CalEEMod, or may be derived from OCTAM.

2. Large Project VMT Analysis

For large or multi-use projects, use of the OCTAM traffic forecasting tool is required. For purposes of County review, a project generating 1,000 ADT or more should use the OCTAM traffic forecasting tool. At this level of trip generating, the probability of trip fulfilment expands to an area greater than the immediate project location and may include a greater regional attraction. The OCTAM traffic forecasting tool can more accurately define the select links used and the total VMT generated by the project.

Next, the project generated efficiency rate, or total VMT, depending on project type, is compared to the appropriate significance threshold. This is either 85 percent of the existing regional average per capita or employment (for the County) for residential and office uses, or no net increase in total VMT for retail or other uses that are consistent with the General Plan. For those projects that require a General Plan Amendment, 85 percent of existing regional average is appropriate, as the project has yet to be evaluated as part of the County's ultimate land development vision.

If the project VMT (expressed as a per capita or per employee rate or total number) is at or less than the significance threshold, the project is presumed to create a less than significant impact. No further analysis is required. If the project is greater than the significance threshold, mitigation measures are required.

D. SIGNIFICANCE THRESHOLDS FOR TRANSPORTATION PROJECTS

The County may continue to use delay and LOS for transportation projects as long as impacts related to "other applicable requirements" are disclosed. This has generally been interpreted as VMT impacts and other State climate change objectives. These other applicable requirements may be found in other parts of an environmental document (i.e., air quality, GHG), or may be provided in greater detail in the transportation section.

For projects on the State highway system, Caltrans will use and will require sponsoring agencies to use VMT as the CEQA metric, and Caltrans will evaluate the VMT

"attributable to the project"(Caltrans Draft VMT-Focused Transportation Impact Study Guide, February 28, 2020). Caltrans'
Intergovernmental Review will review environmental documents for capacity-enhancing projects for the County's analysis of VMT change.

The assessment of a transportation project's VMT should disclose the VMT without the project and the difference in VMT with the project. According to the OPR TA and the County's Guidelines for Evaluating Vehicle Miles Traveled Under CEQA prepared by LSA Associates, Inc. (August 2020)any growth in VMT attributable to the transportation project would result in a significant impact.

The primary difference in these two scenarios (without the project and with the project) to OPR is related to induced growth. Current traffic models have limited abilities to forecast induced growth,as their land use or socioeconomic databases are fixed to a horizon date. OPR

In particular, the OPR TA presents one method to identify the induced growth. This method may be used in Orange County to estimate induced growth attributable to a new roadway capacity. To estimate VMT impacts from roadway expansion projects:

1. Determine the total lane-miles over an area that fully captures travel behavior changes resulting from the project (generally the region, but for projects affecting interregional travel look at all affected regions).

2. Determine the percentage change in total lane miles that will result from the project.

3. Determine the total existing VMT over that same area.

4. Multiply the percentage increase in lane miles by the existing VMT, and then multiply that by the elasticity from the induced travel literature:

[% increase in lane miles] x [existing VMT] x [elasticity] =
[VMT resulting from the project]

It should be pointed out that OPR assigns this induced growth to induced land use.

As an alternative method, Caltrans has identified a computerized tool that estimates VMT generation from transportation projects. It was developed at the University of California, Davis, and is based on elasticities and the relationship of lane mile additions and growth in VMT. It uses Federal Highway Administration definitions of facility type and ascribes VMT increases to each facility. Output includes increases on million vehicle miles per year. Caltrans is investigating its use for all its VMT analyses of capital projects. It is available for use by local agencies and applicants, and the County may recommend utilization of this tool for calculations.

The TA provides other options to identify induced growth- and project-related VMT. These include:

1. Employ an expert panel. An expert panel could assess changes to land use development that would likely result from the project. This assessment could then be analyzed by the travel demand model to assess effects on vehicle travel. Induced vehicle travel assessed via this approach should be verified using elasticities found in the academic literature.

2. Adjust model results to align with the empirical research. If the travel demand model analysis is performed without incorporating projected land use changes resulting from the project, the assessed vehicle travel should be adjusted upward to account for those land use changes. The assessed VMT after adjustment should fall within the range found in the academic literature.

3. Employ a land use model, running it iteratively with a travel demand model. A land use model can be used to estimate the land use effects of a roadway capacity increase, and the traffic patterns that result from the land use change can then be fed back into the travel demand model. The land use model and travel demand model can be iterated to produce an accurate result.

The TA provides additional guidance, below:

> Whenever employing a travel demand model to assess induced vehicle travel, any limitation or known lack of sensitivity in the analysis that might cause substantial errors in the VMT estimate (for example, model insensitivity to one of the components of induced VMT described above) should be disclosed and characterized, and a description should be provided on how it could influence the analysis results. A discussion of the potential error or bias should be carried into analyses that rely on the VMT analysis, such as greenhouse gas emissions, air quality, energy, and noise.

The threshold for significance for a capacity-enhancing roadway project is any additional VMT generated by the project either due to the increased roadway use or as a result of induced growth attributable to the project.

E. SIGNIFICANCE THRESHOLDS FOR LAND PLANS

In the TA, the OPR provided guidance on the treatment of CEQA traffic analyses for land use plans. The TA reiterates previous direction regarding individual land use assessments:

- Analyze the VMT outcomes over the full area over which the plan may substantively affect travel patterns (the definition of region).
- VMT should be counted in full rather than split between origins and destinations (the full impact of the project VMT)

The TA provides a single sentence as consideration for land use plans. It states, “A general plan, area plan, or community plan may have a significant impact on transportation if proposed new residential, office or retail land uses would in aggregate exceed the respective thresholds recommended above.” This recommendation refers to 85 percent of the existing city or regional average, and no net gain for residential, office, and retail land uses.

OPR is recommending a focus on specific trip purposes (i.e., home-based trips for residential projects and work-based trips for office projects). Depending on the modeling

platform, at least four other trip types are recognized as contributors to large-scale plan-level analyses. Home-based origins will have interactions with other non-work-based destinations. Therefore, if home-based trips are the focus of a plan-level assessment, a great deal of VMT would not be accounted for in the estimation of total VMT.

To assess a land plan, use of a traffic-forecasting tool is recommended. The total VMT for the plan should be identified for all trip types and all potential VMT contributors within the plan area. Similar traffic model runs should be conducted for the existing base year and the horizon year with No Project.

Guidelines Section 15064.3(b)(4) states (in part) the following:

> *A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household, or in any other measure.*

Therefore, the recommended methodology for conducting VMT assessments for land plans is to compare the existing VMT per capita for the land plan area with the expected horizon year VMT per service population (population and employment). The recommended target is to achieve a lower VMT per service population in the horizon year with the proposed land plan than occurs for the existing condition.

F.MITIGATION STRATEGIES

The applicant is required, per CEQA, to identify feasible mitigation to mitigate the impact created by the project, to a level that is less than significant. Attachment B list some ideas for potential mitigation strategies. This is not an exhaustive list of feasible mitigation measures that may be applied to the project. As in previous CEQA practice, the applicant/project proponent will be required to identify mitigation measures to reduce, avoid, or offset the specific project-related impacts identified in an individual environmental document. Thus, the applicant should submit other creative, feasible mitigation for their project. The mitigation measures suggested and the related VMT percentage reduction must be reviewed and either approved or rejected by the County.

If the mitigation measures mitigate the project impact to a less than significant level, no further analysis is required. If the project's VMT impact cannot be fully mitigated, the County may: 1) request the project be redesigned, relocated, or realigned to reduce the VMT impact, or 2) prepare an Environmental Impact Report (EIR) with Statement of Overriding Considerations (SOC) for the transportation impacts associated with the project. All feasible mitigation measures must be assigned to and carried out by the project, even if a SOC is prepared.

When a significant CEQA impact is identified according to the thresholds described above, the project proponent will be required to identify feasible mitigation measures in order to reduce, avoid, or offset the impact. Although previous vehicle LOS impacts could be mitigated with locations specific vehicle level of service improvements, VMT impacts likely require mitigation of regional impacts through more behavioral changes. Enforcement of mitigation measures will still be subject to the mitigation monitoring requirements of CEQA, as well as the regular land use police powers of the County. These measures can also be incorporated as a part of plans, policies, regulations, or project designs.

VMT mitigations are not necessarily physical improvements; rather, they are complex in nature and will significantly depend on changes in human behavior.

Mitigation Measures and Project Alternatives

Land Development Projects and Community/General Plans: Mitigations and project alternatives for VMT impacts have been suggested by the OPR and are included in the TA. VMT mitigation can be extremely diverse and can be classified under several categories such as land use/location, road pricing, transit improvements, commute trip reduction strategies, and parking pricing/policy. Improvements related to VMT reduction strategies have been quantified in sources such as the California Air Pollution Control Officers Association (CAPCOA) report Quantifying Greenhouse Gas Mitigation Measures (CAPCOA Green Book) and CARB sources and are generally presented in wide ranges of potential VMT reduction percentages.

Appendix B of the Guidelines for Evaluating Vehicle Miles Traveled Under CEQA (August 2020) provides a brief menu of the different potentially applicable VMT mitigation measures and project alternatives stated in the CAPCOA Green Book (only those strategies directly attributed to transportation) and the OPR TA for land development projects. This discussion does not present an exhaustive list of feasible mitigation measures that may be applied to a project. As in previous CEQA practice, the applicant/project proponent will be required to identify mitigation measures to the County to reduce, avoid, or offset the specific project-related impacts identified in an individual environmental document.

Transportation Projects: Although OPR provides detailed guidance on how to assess induced-growth impacts associated with transportation projects, it leaves the subject of mitigation measures vague. Only four strategies are suggested as mitigation measures:

- Tolling new lanes to encourage carpools and fund transit improvements Converting existing general-purpose lanes to HOV or HOT lanes
- Implementing or funding off-site travel demand management
- Implementing Intelligent Transportation Systems strategies to improve passenger throughput on existing lanes

ATTACHMENT A
COUNTY OF ORANGE: FAIR-SHARE FORMULA FOR TRAFFIC IMPACTS

One of the goals of the County's Transportation Element and the Growth Management Program is to ensure that new development pays its fair share for transportation improvements commensurate with the impacts created by said development. In order to ensure that a uniform method is applied to assess traffic impacts of each development, a Task Force consisting of representatives of the development community and traffic engineers was established to develop a fair share formula to assess traffic impacts of a development. The Task Force acknowledged that there was a need to establish not only a fair–share formula but also a procedure to implement it. The procedure should allow for flexibility in the implementation of any mitigation. After working for more than a year, the Task Force developed a fair share formula with the following goals and procedure. This fair-share formula is to be applied to all development in the County unincorporated areas.

Goals

1. It should be consistent with County's GMP in that it uses Intersection Capacity Utilization (ICU) methodology to identify impacted intersections and is consistent with the County's level of service (LOS) "D" policy

2. It should provide positive values not exceeding 100%.

Procedure

1. Identify intersections that will experience a significant adverse impact by a proposed project (> 1% change in AM or PM Peak hour LOS). This should be done by comparing the with and without project impact for the near-term and long-term horizon years pursuant to the County GMP. This analysis should use the ICU methodology.

2. Determine a project's share of the intersection improvement(s). This is based on a project's total trips approaching an intersection, in the peak hour most impacted, as a percentage of new trips (Future- Existing) at that location. To determine a project's

approach trips, at any location a 'select zone' analysis (modeled or manual) as appropriate, should be utilized.

3. Project proponent and the County shall cooperate in determining a feasible mitigation program and associated cost. The project's share of the mitigation cost shall be based on the cost of the mitigations needed to bring the intersection condition to LOS 'D' or better.

4. A cost cap of a project's total obligation should be established, once all the fair share mitigation costs of a project are determined.

5. County and project proponent shall cooperate in developing a mitigation implementation program. In recognition of possible operational and/or financial constraints of implementing an improvement at a specific location, the County and the project proponent can mutually agree on implementing an equivalent improvement, at another location impacted by the project, to satisfy the project's obligation.

ATTACHMENT B
Guidelines for Evaluating Vehicle Miles Traveled (August 2020)

LSA

GUIDELINES FOR EVALUATING VEHICLE MILES TRAVELED UNDER CEQA

for the
COUNTY OF ORANGE

AUGUST 7, 2020

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GUIDELINES FOR EVALUATING VEHICLE MILES TRAVELED UNDER CEQA

COUNTY OF ORANGE

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August 2020

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LIST OF ABBREVIATIONS AND ACRONYMS

ADT	average daily trips
CalEEMod	California Emissions Estimator Model
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CO_2e	carbon dioxide equivalent
County	County of Orange
EO	Executive Order
FAR	floor-to-area ratio
Guidelines	2020 *State CEQA Guidelines*, 14 California Code of Regulations, Section 15000, et. seq.
GWP	global warming potential
HOT	high-occupancy toll
HOV	high-occupancy vehicle
HQTA	High-Quality Transit Area
LOS	level of service
LRTP	Long-Range Transportation Plan
mi	mile
MT	metric ton
MPO	Metropolitan Planning Organizations
OCTAM	Orange County Transportation Analysis Model
OPR	Governor's Office of Planning and Research

PRC	Public Resources Code
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
RTPA	Regional Transportation Planning Agency
SB	Senate Bill
SCAG	Southern California Association of Government
SOC	Statement of Overriding Considerations
TA	Technical Advisory
TDM	transportation demand management
TPA	Transit Priority Area
TSP	Transit Signal Priority
VMT	vehicle miles traveled

1.0 INTRODUCTION

Senate Bill (SB) 743, signed in 2013, changed the way transportation studies are conducted in California Environmental Quality Act (CEQA) documents. Vehicle miles traveled (VMT) replaces motorist delay and level of service (LOS) as the metric for impact determination. For land development projects, VMT is simply the product of the daily trips generated by a new development and the distance those trips travel to their destinations. For capital projects, impacts are identified as the new VMT attributable to the added capital project, both from the installation of the facility and the induced growth.

This document serves as a guide for application and substantial evidence for the County of Orange's (County) adopted project screenings, significance thresholds, and mitigation strategies, modeled after the Governor's Office of Planning and Research's (OPR) Technical Advisory (TA) for CEQA transportation studies; however, as in previous CEQA practice, the applicant/project proponent will still be required to provide traffic analysis that is specific to the proposed project to be reviewed and approved by the County. These guidelines apply to all projects for which the County is the Lead Agency for certification or adoption of CEQA documents. If the County is the Lead Agency, but the project is located in another jurisdiction, these guidelines would apply. However, if the County is not the Lead Agency, and the project is located in another jurisdiction, the Lead Agency would determine which VMT guidelines should be used for analysis.

In January 2019, the Natural Resources Agency and the OPR codified SB 743 into the Public Resources Code (PRC) and the *State CEQA Guidelines*.

The *State CEQA Guidelines*, included in Title 14 of the California Code of Regulations, Section 15064.3 subdivision (b)—hereafter referred to as the Guidelines—states the following criteria for analyzing transportation impacts:

1. **Land Use Projects.** Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.

2. **Transportation Projects.** Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent that such impacts have already been adequately addressed at a programmatic level, such as in a regional transportation plan EIR, a lead agency may tier from that analysis as provided in Section 15152.

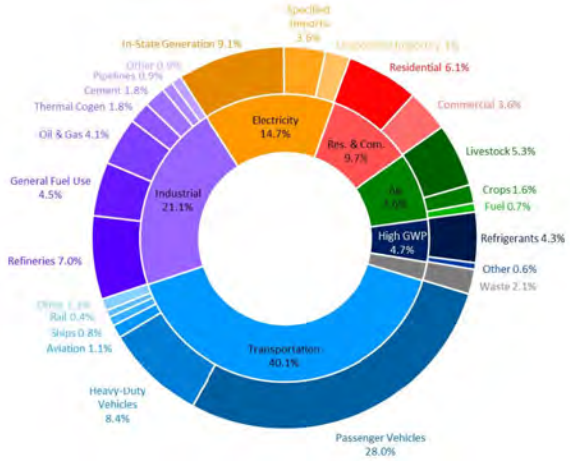
3. **Qualitative Analysis.** If existing models or methods are not available to estimate the vehicle miles traveled for the particular project being considered, a lead County may analyze the project's vehicle miles traveled qualitatively. Such a qualitative analysis would evaluate factors

such as the availability of transit, proximity to other destinations, etc. For many projects, a qualitative analysis of construction traffic may be appropriate.

4. **Methodology.** A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household, or in any other measure. A lead agency may use models to estimate a project's vehicle miles traveled, and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revisions to model outputs should be documented and explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section.

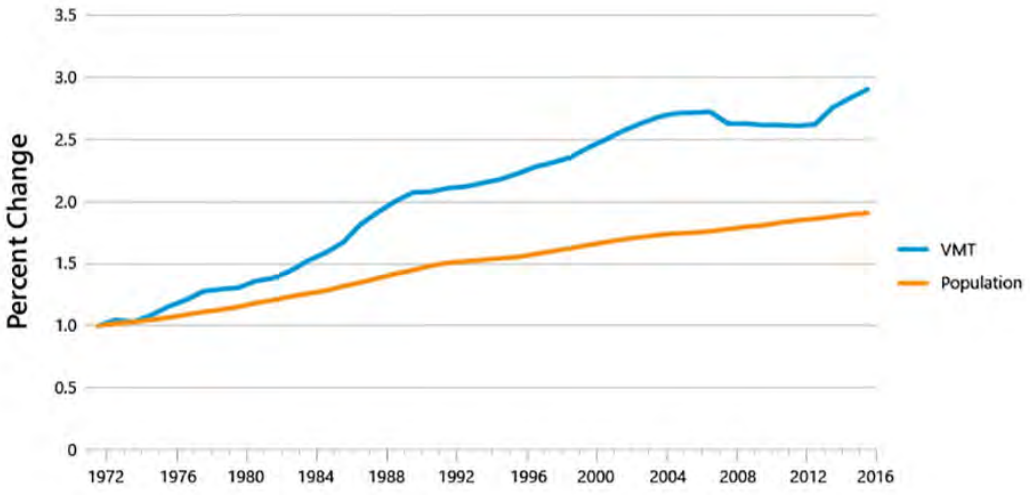
The OPR provides a TA (see Appendix A) as a guidance document to establish thresholds under this new VMT metric. The laws and rules governing the CEQA process are contained in the CEQA statute (PRC Section 21000 and following), the Guidelines (California Code of Regulations, Title 14, Section 15000 and following), published court decisions interpreting CEQA, and locally adopted CEQA procedures. The TA is intended as a reference document; it does not have the weight of law, but is intended by OPR to provide substantial evidence for the thresholds proposed therein. Thus, deviating from the TA is best undertaken with substantial evidence to support the County action.

The State of California has committed to reducing greenhouse gas (GHG) emissions and achieving long-term climate change goals. To achieve these climate change goals, the State has determined that overall VMT needs to be reduced. As Figure 1 shows, transportation is the single largest sector contributing to the State's GHG emissions. More than 40 percent of the GHG emissions come from the transportation sector, primarily passenger cars and light-duty trucks. According to the State, removing these vehicle trips and/or reducing the length of existing trips is expected to result in reduced VMT and reduced GHG emissions. As illustrated in Figure 2, over the last 40 years, VMT has grown faster than population growth. According to the OPR and the State, the new Guidelines and the establishment of VMT thresholds for CEQA analyses are linked to GHG reduction strategies and overall statewide climate change goals.



Source: California Greenhouse Gas Emissions for 2000 to 2017 Trends of Emissions and Other Indicators (California Air Resources Board Report)

Figure 1: 2017 GHG Emissions in California by Scoping Plan Sector and Sub-Sector Category

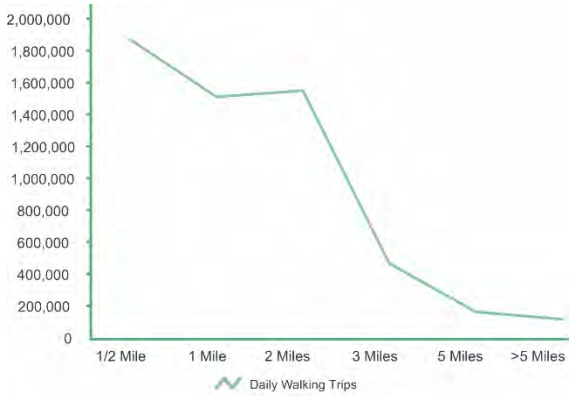


Source: https://ca50million.ca.gov/transportation/

Figure 2: California Statewide Population and VMT Trends

The State and the Southern California Association of Governments (SCAG), the metropolitan planning organization for Southern California, have provided guidance that the number of vehicle trips and the length of vehicle trips can be reduced by locating new development near available transit and a mix of other land uses. This is one example of a strategy to reduce project related VMT. SB 743 is intended to promote infill development, encourage multimodal transportation networks, and reduce GHG emissions.

In one example, SCAG's Draft Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) (SCAG 2019) includes data showing that the number of walking trips greatly diminishes for distances longer than 2 miles (Figure 3). If a person's destination or a transit station are within 2 miles of a person's home, the person may choose a non-vehicle travel mode.



Sources: SCAG Connect Socal: The 2020-2045 RTP/SCS Active Transportation Technical Appendix, Page 30; California Household Travel Survey (2012).

Figure 3: SCAG Region Total Number of Daily Walking Trips by Distance

This document provides a guide for application and substantial evidence for the County's adopted thresholds of significance, modeled after OPR's suggestions, for CEQA transportation studies. It is divided into chapters, including:

- **Chapter 2 – Definition of Region:** Here, the document describes what the comparative region is for analysis purposes. Each project will be compared to an existing regional average. The geographical area that defines the region is defined and described.

- **Chapter 3 – Project Screening:** This chapter provides criteria, and, where applicable, substantial evidence for screening out certain types of projects that, by their nature, or by virtue of other factors, would result in less than significant transportation impacts. This is consistent with the OPR's acknowledgment that certain projects are either low VMT generators, or by virtue of their location would have a less than significant impact.

- **Chapter 4 – Significance Thresholds for Land Development Projects:** In this chapter, the threshold that would define a significant CEQA impact for land use projects is identified. This threshold is linked to a specific travel mode and a set of trip purposes. The actual VMT metric (either an efficiency rate or total VMT) is described.

- **Chapter 5 – Significant Thresholds for Transportation Projects:** This chapter describes the method to evaluate significant CEQA impacts associated with transportation projects. Many non-vehicular capital projects are presumed to have a less than significant impact. Capacity-enhancing projects may have significant impacts and will be subject to a detailed analysis that will include measuring induced travel.

- **Chapter 6 – Significance Thresholds for Land Plans:** This chapter provides guidance and substantial evidence to support the County's treatment of land use plans and their CEQA transportation analysis.

- **Chapter 7 – Mitigation Strategies:** This chapter provides examples of potential mitigation strategies. It is noted that this discussion does not present an exhaustive list of feasible mitigation measures that may be applied to a project. As in previous CEQA practice, the applicant/project proponent will be required to identify mitigation measures to reduce, avoid, or offset the specific project-related impacts identified in an individual environmental document.

2.0 DEFINITION OF REGION: VEHICLE MILES TRAVELED CONTEXT AND DETERMINING THE BASELINE

The question of context defines the scope of the VMT analysis. The common term for this in previous delay-based LOS analyses is ***project study area***. In the delay-based LOS analyses, a project study area is generally determined based on the incremental increase in traffic from the project and its potential to create a significant LOS impact. This generally includes intersections and roadway segments where the project would add a prescribed number of peak-hour trips. Many times, lead agencies stop study area boundaries at their jurisdictional borders.

Based on the evidence and analysis provided below, the "Region" for Orange County is the entire county area.

Region is not defined in the TA. Instead, the OPR offers the following suggestions:

> *In cases where the region is substantially larger than the geography over which most workers would be expected to live, it might be appropriate to refer to a smaller geography, such as **county**, that includes the area over which nearly all workers would be expected to live (page 16).*
>
> 1. *For residential projects in unincorporated county areas, the local County can compare a residential project's VMT to (1) the region's VMT per capita, or (2) the aggregate population weighted VMT per capita of all cities in the region.*

The TA bases recommendations for thresholds for the primary land use types (residential and office) on a comparison to a ***regional average***. The County will utilize the region's VMT per capita approach. The OPR guidance recommends consistency in approach; once a region is established, that region should be used for all subsequent traffic analyses.

Other large or urbanized areas around the State have been surveyed to identify what region has been established for VMT thresholds. In most cases, the county boundary has been identified as the region selected for VMT analysis. In some cases, this county boundary has other names, such as the Council of Governments boundary.

County is a common and reoccurring context for CEQA VMT analyses throughout the State. According to the Orange County Transportation Analysis Model (OCTAM 5.0), of the total trips in and out of Orange County, about 21 percent originate and are destined within the unincorporated county area. Another 67 percent of trips originate or are destined within the municipal jurisdictions (cities) in Orange County. The remaining 12 percent of Orange County trips have a trip end in the other counties of the SCAG region or beyond. Because the majority of the unincorporated county trips are contained within the entirety of Orange County (approximately 88 percent) and many other large urbanized areas are defining their region as their counties, the use of Orange County in its entirety is defined as the region for CEQA land development transportation analyses.

Table A: County of Orange Unincorporated Vehicle Miles Traveled Data (Using OCTAM Base Year 2016)

Table 1 - San Diego Trips

Region	Total Trips	Trips to/from San Diego	Percent San Diego Trips
Unincorporated Orange County	668,689	3,165	0.5%
Total Orange County (including unincorporated Orange)	19,004,260	69,830	0.4%

Table 2 - Percent County of Orange Trips with Orange County as region

Trips within Unincorporated Orange County + Trips between Unincorporated and Incorporated Orange County	525,288
Total Trips within Entire Orange County (Internal - Internal)	8,559,626
Percent County of Orange Trips within Orange County	**6.1%**

Table 3 - Percent County of Orange Trips with Orange County + 10 mile buffer as region

Trips within Unincorporated Orange County + Trips between Unincorporated and Incorporated Orange County, and 10-mile buffer around Orange County (parts of LA, Riverside, and San Bernadino County)	575,922
Total Trips within Entire Orange County + 10-Mile Buffer around Orange County (Internal - Internal)	14,800,711
Percent County of Orange Trips within Orange County + 10-mile Buffer	**3.9%**

Table 3a - Percent County of Orange Trips with Orange County + 10 mile buffer as region

Total Trips to/from Entire Orange County (includes unincorporated Orange County + external trips)	9,451,544
Trips within Entire Modeling area (Orange, LA, Ventura, Riverside, and San Bernadino Counties + External Stations)	48,342,620
Percent Orange County Trips in Entire Modeling Area	**19.6%**

Table 4 - VMT Per Capita

Region	Total Homebased VMT	Total Household Population	VMT/Capita
Unincorporated Orange County	3,477,242	145,121	24.0
Total Orange County (including unincorporated Orange)	56,757,571	3,179,626	17.9
Total Orange County + Part LA, Riverside, and SB Counties (10 miles from county boundary)	116,115,946	6,241,508	18.6

Table 5 - VMT Per Employee

Region	Total Homebased Work VMT	Total Employment	VMT/Employee
Unincorporated Orange County	1,348,364	33,312	40.5
Total Orange County (including unincorporated Orange)	41,174,971	1,710,147	24.1
Total Orange County + Part LA, Riverside, and SB Counties (10 miles from county boundary)	66,768,783	2,766,068	24.1

Source: OCTAM5 Base Year model run (2016)

It should be recognized the use of Orange County as the region defines the comparative (i.e., baseline), or the denominator, in the identification of project-related impact. The numerator is the project's VMT contribution. The project-related/generated VMT profile may go beyond the county boundary and not be truncated by a jurisdictional boundary. For example, a new, large land development proposed near Orange County's eastern boundary may include VMT from as far away as Corona or other communities in Riverside and San Bernardino counties. In that case, it would be the responsibility of the applicant and their traffic study preparer to include the project VMT, regardless of geographical limit, to the satisfaction of the County staff. This project-related VMT profile would be compared against the County regional baseline.

Unlike delay-based LOS analyses, VMT is a regional effect not defined by roadway, intersection, or pathway. The OPR acknowledges this in its TA (page 6), which states,

> *Lead agencies should not truncate any VMT analysis because of jurisdictional or other boundaries by failing to count the portion of a trip that falls outside the jurisdiction or by discounting the VMT from a trip that crosses a jurisdictional boundary.*

Table A is used as the current 2020 calculations to demonstrate what calculations should be applied. Tables 2, 4, and 5, in Table A identify the relevant VMT baselines for the region. These baselines will be revised as the OCTAM is revised beyond version 5.0. Applicants should use the most up-to-date version of the OCTAM in setting the baseline and analyzing their project.

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3.0 PROJECT SCREENING

The TA acknowledges that certain activities and projects may result in a less-than-significant impact to transportation and circulation. A variety of projects may be screened out of a complicated VMT analysis due to the presumption described in the TA regarding the occurrence of less-than-significant impacts.

3.1 Land Development Projects

The TA acknowledges that conditions may exist under which a land development project would have a less than significant impact on transportation and circulation. These may be size, location, proximity to transit, or trip-making potential.

Land development projects that have one or more of the following attributes may be presumed to create a less than significant impact on transportation and circulation.

- **Project in High-Quality Transit Area (HQTA):** The project is within 0.5 mile (mi) of a Transit Priority Area (TPA) or an HQTA, unless the project is inconsistent with the RTP/SCS, has a floor-to-area ratio (FAR) less than 0.75, provides an excessive amount of parking, or reduces the number of affordable residential units. In accordance with SB 743, "Transit priority areas" are defined as "an area within one-half mile of a major transit stop that is existing or planned, if the planned stop is scheduled to be completed within the planning horizon included in a Transportation Improvement Program. A Major Transit Stop means: "a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service of 15 minutes or less during the morning and afternoon peak commute periods." An HQTA or Corridor is a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.

  Figure 4 depicts TPAs within unincorporated Orange County[1], including HQTA corridors served by the Orange County Transportation Authority with service intervals of 15 minutes or less and major transit stops along the Metrolink[2] system. Although the figure shows the San Clemente Pier Metrolink station, it does not qualify as a major transit stop because service is limited to weekends. Projects proposed in these areas would be presumed to have a less than significant transportation impact unless the project is inconsistent with the RTP/SCS, has an FAR less than 0.75, provides an excessive amount of parking, or reduces the number of affordable residential units.

- **Neighborhood Retail Project:** The project involves local-serving retail space of less than 50,000 square feet.

- **Affordable Housing Project:** The project is 100 percent affordable-housing units.

1 Figure 4 may be updated periodically as necessary.
2 Amtrak runs along Metrolink's Orange County route and stops at many Orange County Metrolink stations.

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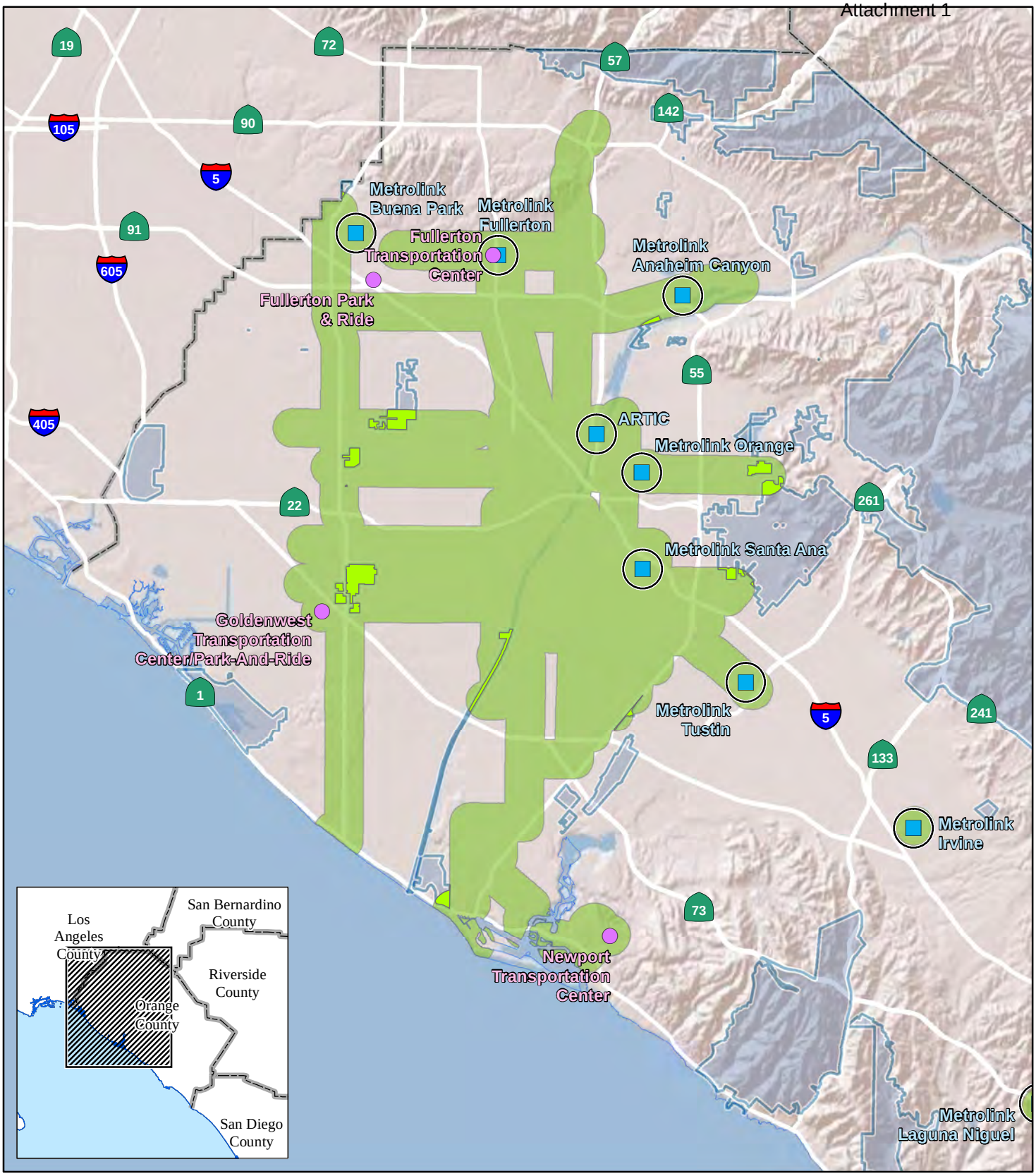

LSA

LEGEND

- Unincorporated Areas of Orange County
- High Quality Transit Areas
- Unincorporated Areas within High Quality Transit Areas
- Transportation Centers
- Metrolink Station (with half-mile buffer)

N

0 1.75 3.5
MILES

FIGURE 4
Sheet 1 of 2

CEQA Transportation Thresholds of Significance Guide

County of Orange Transit Priority Areas

SOURCE: OCPW (3/2020), SCAG (6/2019); OCTA (11/2019); Bing (2019)

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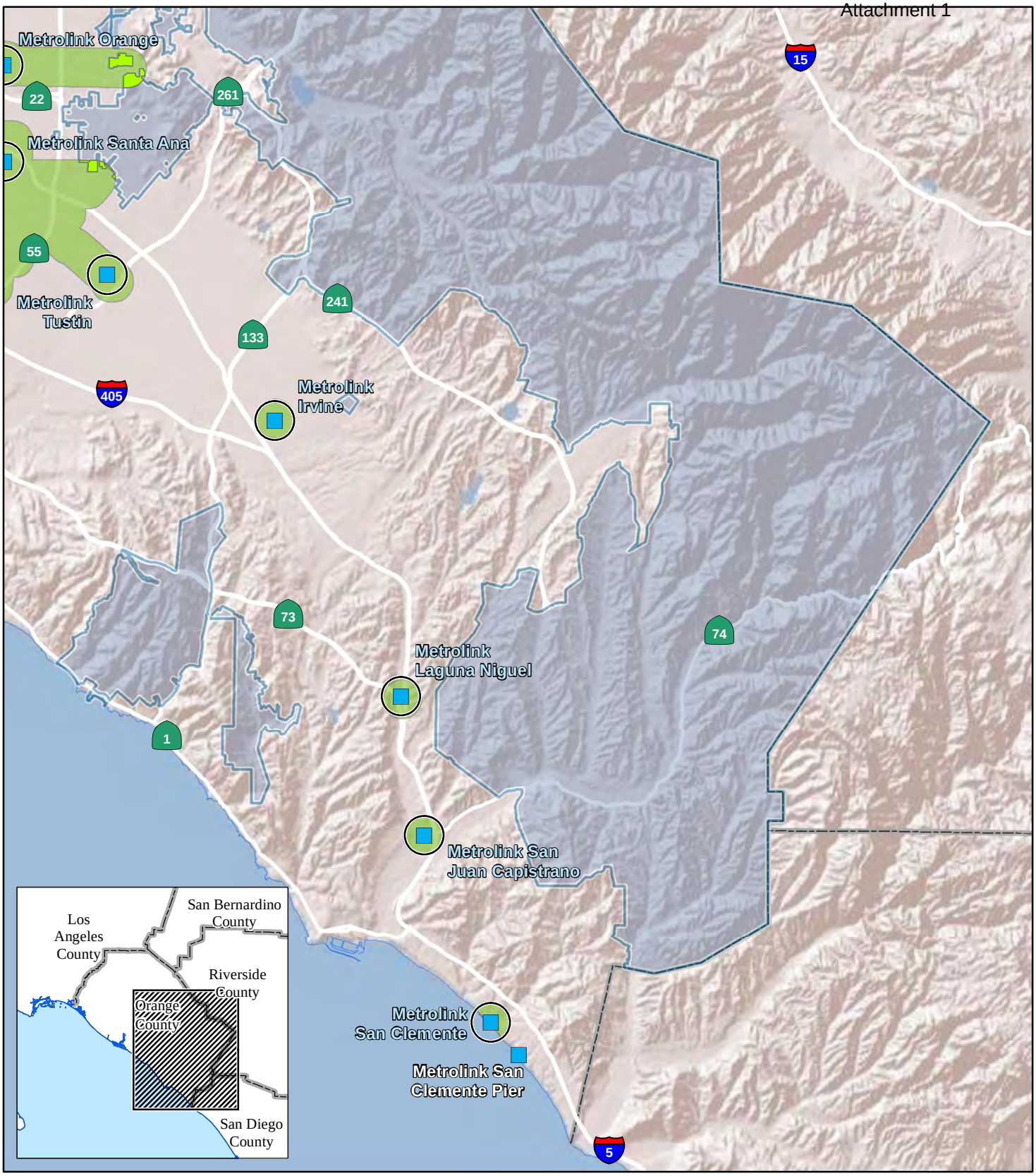

LSA

LEGEND

- Unincorporated Areas of Orange County
- High Quality Transit Areas
- Unincorporated Areas within High Quality Transit Areas
- Transportation Centers
- Metrolink Station (with half-mile buffer)

0 1.75 3.5
MILES

SOURCE: OCPW (3/2020), SCAG (6/2019); OCTA (11/2019); Bing (2019)

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FIGURE 4
Sheet 2 of 2

CEQA Transportation Thresholds of Significance Guide

County of Orange Transit Priority Areas

- **Low VMT Area[3] Project:** The project is in low VMT areas. The applicant may submit data from the most recent OCTAM version showing the proposed project is within a low VMT area, which may be used, at the discretion of staff, to screen out the project.

- **Small Project:** A project generates 500 or fewer average daily trips (ADT). The TA recommends a volume of 110 ADT as the low volume that would allow the project to be screened out. This recommendation is not based on any analysis of GHG reduction, but was instead based on the potential trip generation of an office project that would already be categorically exempt under CEQA. LSA prepared a deeper analysis and used the California Emissions Estimator Model (CalEEMod, version 2016.3.2) to correlate the effect of changes in project-related ADT to the resulting GHG emissions. This model was selected because it is provided by the California Air Resources Board (CARB) to be used statewide for determining project-level GHG emissions. CalEEMod was used with the built-in default trip lengths and types to show the vehicular GHG emissions from incremental amounts of ADT. Table B shows the resulting annual VMT and GHG emissions from the incremental ADT.

Table B: Representative Vehicle VMT and GHG Emissions from CalEEMod

Average Daily Trips	Annual Vehicle Miles Traveled	GHG Emissions (metric tons CO_2e per year)
200	683,430	258
300	1,021,812	386
400	1,386,416	514
500	1,703,020	643
600	2,043,623	771

Source: CalEEMod version 2016.3.2. Example project used: 50 single-family Homes in Orange County.
CalEEMod = California Emissions Estimator Model
CO_2e = carbon dioxide equivalent
GHG = greenhouse gas

A common GHG emissions threshold is 3,000 metric tons (MT) of carbon dioxide equivalent[4] (CO_2e) per year. Vehicle emissions are typically more than 50 percent of the total project GHG emissions. Thus, a project with 500 ADT would generally have total project emissions that could be less than 1,300 MT CO_2e/year (i.e., 50 percent or 643 MT CO_2e/year coming from vehicle emissions and the other 50 percent coming from other project activities). As this level of GHG

3 Orange County's land area may be described in terms of low, medium and high VMT areas based on thresholds described in Chapter 4. These descriptions are Low: less 85 percent of the regional average; Medium: equal to or more than 85 percent of the regional average **and** less than or equal to 117 percent of regional average; and High: greater than 117 percent of regional average.

4 Carbon dioxide equivalent (CO_2e) is a concept developed to provide one metric that includes the effects of numerous GHGs. The global warming potential (GWP) of each GHG characterizes the ability of each GHG to trap heat in the atmosphere relative to another GHG. The GWPs of all GHGs are combined to derive the CO_2e.

emissions would be less than 3,000 MT CO_2e/year, the emissions of GHG from a project up to 500 ADT would typically be less than significant.

The County's current Transportation Implementation Manual establishes screening criteria of 200 ADT. However, based on the analysis in Table B, projects with fewer than 500 ADT are unlikely to result in significant impacts.

Based on this qualitative analysis, the County establishes screening criteria for small projects of up to 500 ADT.

- **Public Facilities:** The development of institutional/government and public service uses that support community health, safety or welfare are also screened from subsequent CEQA VMT analysis. The following includes some examples and is not an exhaustive list of public facilities that are screened from subsequent CEQA VMT analysis: police/sheriff stations, fire stations, community centers, refuse stations, jails, and landfills. These facilities are already part of the community and, as a public service, the VMT is accounted for in the existing regional average. Many of these facilities also generate fewer than 500 ADT and/or use vehicles other than passenger-cars or light duty trucks. These other vehicle fleets are subject to regulation outside of CEQA, such as CARB and the South Coast Air Quality Management District.

3.2 Transportation Projects

The primary attribute to consider with transportation projects is the potential to increase vehicle travel. While the County has discretion to continue to use delay analysis for CEQA disclosure of transportation projects, changes in vehicle travel must also be quantified.

The TA lists a series of projects that would not likely lead to a substantial or measurable increase in vehicle travel and that, therefore, would generally not require an induced travel analysis. The current list of projects, which is not intended to be exhaustive, includes the following examples:

- Rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets (e.g., highways; roadways; bridges; culverts; Transportation Management System field elements such as cameras, message signs, detection, or signals; tunnels; transit systems; and assets that serve bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity

- Roadside safety devices or hardware installation such median barriers and guardrails

- Roadway shoulder enhancements to provide "breakdown space," dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes

- Addition of an auxiliary lane of less than 1 mile in length designed to improve roadway safety

- Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left-, right-, and U-turn pockets, two-way left-turn lanes, or emergency breakdown lanes that are not utilized as through lanes
- Addition of roadway capacity on local or collector streets, provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit
- Conversion of existing general-purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel
- Addition of a new lane that is permanently restricted to use only by transit vehicles
- Reduction in the number of through lanes
- Grade separation to separate vehicles from rail, transit, pedestrians, or bicycles, or to replace a lane in order to separate preferential vehicles (e.g., high-occupancy vehicles [HOVs], high-occupancy toll [HOT] lane traffic, or trucks) from general vehicles
- Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features
- Installation of traffic metering systems, detection systems, cameras, changeable message signs, and other electronics designed to optimize vehicle, bicycle, or pedestrian flow
- Timing of signals to optimize vehicle, bicycle, or pedestrian flow
- Installation of roundabouts or traffic circles
- Installation or reconfiguration of traffic calming devices
- Adoption of or increase in tolls
- Addition of tolled lanes, where tolls are sufficient to mitigate VMT increase
- Initiation of a new transit service
- Conversion of streets from one-way to two-way operation with no net increase in the number of traffic lanes
- Removal or relocation of off-street or on-street parking spaces
- Adoption or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)
- Addition of traffic wayfinding signage

- Rehabilitation and maintenance projects that do not add motor vehicle capacity
- Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way
- Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve nonmotorized travel
- Installation of publicly available alternative fuel/charging infrastructure
- Addition of passing lanes, truck climbing lanes, or truck brake-check lanes in rural areas that do not increase overall vehicle capacity along the corridor

Additionally, transit and active transportation projects generally reduce VMT and are, therefore, presumed to cause a less than significant impact on transportation. This presumption may apply to all passenger rail projects, bus and bus rapid-transit projects, and bicycle and pedestrian infrastructure projects.

4.0 SIGNIFICANCE THRESHOLDS FOR LAND DEVELOPMENT PROJECTS

The TA states that SB 743 and all CEQA VMT transportation analyses refer to automobiles. Here, the term automobile refers to on-road passenger vehicles, specifically cars and light-duty trucks (page. 4). Heavy-duty trucks can be addressed in other CEQA sections and are subject to regulation in a separate collection of rules under CARB jurisdiction. This approach was amplified by Chris Ganson, Chief Planner at OPR in a recent presentation at the Fresno Council of Governments (October 23, 2019) and by Ellen Greenberg, California Department of Transportation (Caltrans) Deputy Director for Sustainability, at the San Joaquin Valley Regional Planning Association meeting (January 9, 2020).

The OPR has identified the subject of the thresholds as the primary trips in the home-based typology: specifically, home-based work trips. This includes residential uses, office uses, and retail uses. The home-based work trip type is the primary tripmaking during the peak hours of commuter traffic in the morning and evening periods.

The focus of analyzing transportation impacts has shifted from congestion to climate change, and the purpose of the CEQA analysis is to disclose and ultimately reduce GHG emissions by reducing the number and length of automobile trips. This change in CEQA analysis does not diminish the County's ability to require an LOS analysis to confirm accessibility to a project site, conformance with General Plan policies, or as a function of their general health, safety, and welfare discretion and authority. As part of the SB 375 land use/transportation integration process and the GHG goal setting, most metropolitan planning organizations and regional transportation planning agencies have agreed to reduce GHG through integrated land use and transportation planning by approximately 15 percent by 2035. Furthermore, in its 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals, the CARB recommends total VMT per capita rates approximately 15 percent below existing conditions.

The TA therefore recommends:

> *A proposed (residential) project exceeding a level of 15 percent below existing regional average VMT per capita may indicate a significant transportation impact.*
>
> *A similar threshold would apply to office projects (15 percent below existing regional average VMT per employee).*
>
> *VMT generated by retail projects would indicate a significant impact for any net increase in total VMT.*

While regional planning documents such as the RTP/SCS calculate a single VMT rate by dividing total VMT for the SCAG region by the total service population, it should be noted that the TA identifies a different denominator for the residential and office comparison rates. If regional average VMT per capita and VMT per employee were calculated using the service population (population plus employment), the denominator would be the same, which would be inconsistent with the TA. Furthermore, using service population to calculate regional average rates would complicate future project analyses.

The environmental document for a proposed land use project will identify population for a residential project and employment for an office project. These values should be used in the transportation analysis to calculate the project's VMT per capita or VMT per employee. If a project's VMT per capita (VMT/project population) or VMT per employee (VMT/project employment) is compared to a regional average based on service rate (VMT/[regional population + employment]), the comparison is not equivalent.

According to the Orange County Transportation Authority calculations using OCTAM 5.0, the average VMT/capita in Orange County is 17.9. The average VMT/employee in Orange County is 24.1.

Mixed-use projects should be evaluated for each component of the project independently, or the County may use the predominant land use type for the analysis. Credit for internal trip capture should be accounted for. No discrete land use types other than residential, office, or retail are identified for threshold development in the TA.

The TA suggests that the County may, but is not required to, develop thresholds for any other use. One approach is to review the County General Plan and/or Countywide Long-Range Transportation Plan (LRTP) and identify whether the implementation of the plan would result in a reduction of VMT and GHGs. If it does, the County may conclude the implementation of the plan, including all the other land use types to achieve the regional climate change goals. Therefore, consistency with the plan and no net change in VMT per employee is a rational threshold for the other land use types. This approach would require disclosure of substantial evidence, including the General Plan or LRTP findings, and other supporting traffic and air quality forecasting support.

4.1 Summary

In summary, the County's thresholds of significance for the following land uses are:

- **Residential –** 15 percent below existing regional average VMT per capita (17.9 X 0.85 = 15.2)
- **Office –** 15 percent below existing regional average VMT per employee (24.1 X 0.85 = 20.5)
- **Retail –** no net change in total VMT
- **Mixed Use:** consider each component of the project separately based on the threshold for residential, office, retail, etc. and take credit for internal capture
- **Other Land Uses –** no net change in VMT per employee if consistent with the General Plan or 15 percent below regional average if seeking a General Plan Amendment

Figure 5 demonstrates the potential land development entitlement process to comply with the Guidelines related to VMT and transportation impacts. It provides the path from application filing through determination of impacts. It is presented as the standard process; each development application is considered unique and may create alternative or modified steps through the process. Each step that diverges from this standard process should be accompanied with substantial

evidence demonstrating compliance with other climate change and GHG emission reduction laws and regulations.

4.2 Agency Communication

At the outset of the project development process, the applicant should seek a meeting with County staff to discuss the project description, the transportation study content, and the analysis methodology. Key elements to address include describing the project in sufficient detail to generate trips and identify the potential catchment area (i.e., trip lengths, if no modeling is being undertaken), estimating project VMT, discussing project design features that may reduce the VMT from the project development, and discussing the project location and associated existing regional VMT percentages. As a result of the meeting, the applicant or their consultant shall prepare a transportation analysis scope of work for review and approval by the County.

4.3 Project Screening

Once a development application is filed, project screening is conducted as the initial step. If the project meets any one of the screening criteria for VMT, the project may be presumed to create a less than significant impact in the area of transportation and circulation and no further analysis as to this topical environmental area is necessary. The CEQA document should enumerate the screening criteria and how the project meets or exceeds that threshold. If project screening does not apply, a VMT analysis may be required, in accordance with CEQA. The extent of this analysis may be a simple algebraic demonstration or a more sophisticated traffic modeling exercise.

4.4 Project VMT Analysis

The first step is to identify the project land use type and the appropriate efficiency rate to use. If the project is residential, use the per capita (or residential population) efficiency rate. If the project is commercial office (or a similar trip generator), use the per employee efficiency rate. For retail projects, use the total VMT generated by the project. For mixed use projects, report each land use after generating trips, taking credit for internal trip capture, to arrive at the VMT. As an alternative, the predominant use may be reported for mixed-use projects. For all other uses, use the VMT per employee as the comparative.

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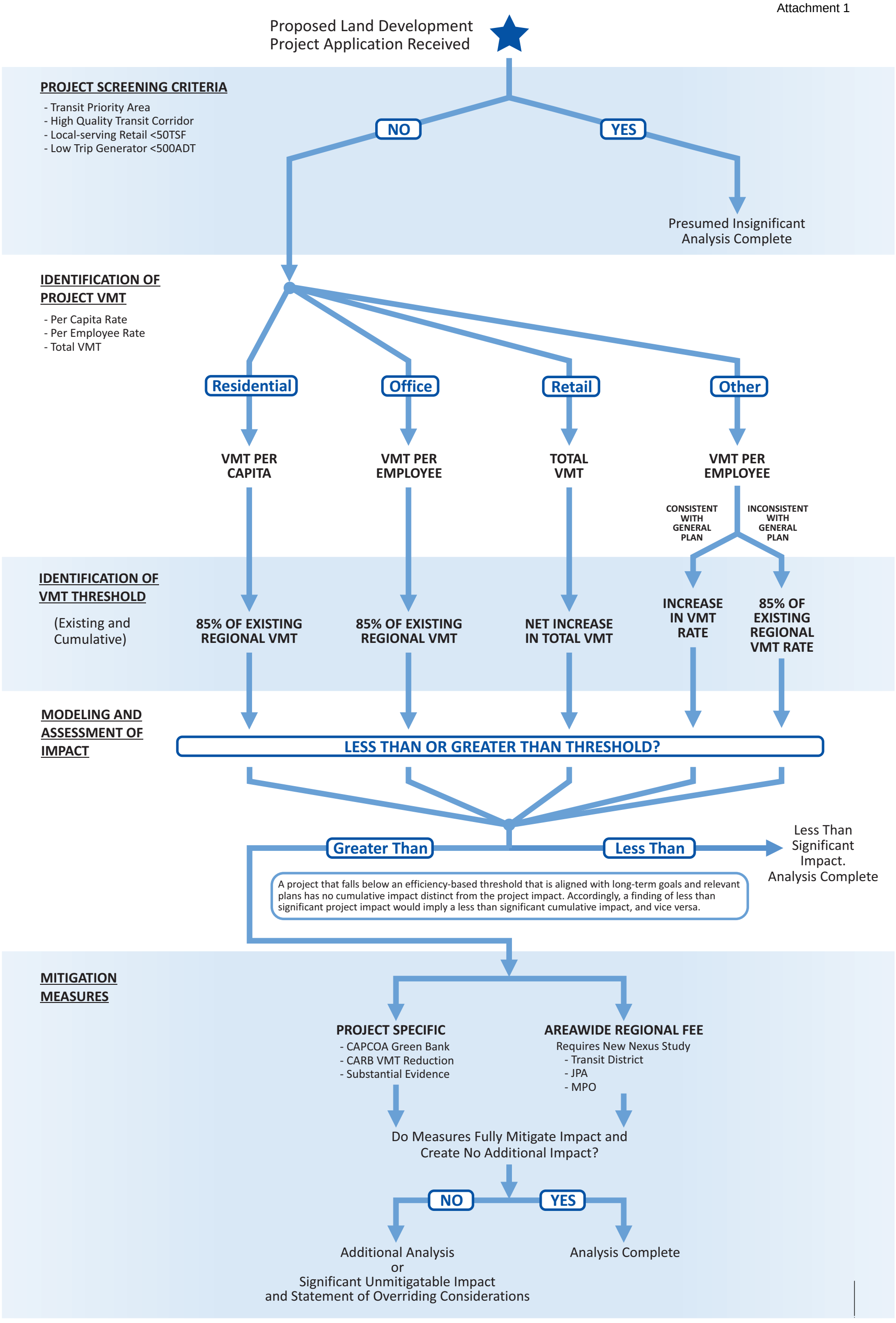

LSA

FIGURE 5

CEQA Transportation Thresholds of Significance Guide

Transportation Impacts Flow Chart for Land Development Projects

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4.4.1 Medium Project VMT Analysis

For medium-sized projects (projects generating greater than 500 ADT but less than 1,000 ADT) or those with one predominant use, the determination of project VMT may be identified manually as the product of the daily trip generation (land use density/intensity multiplied by the County-approved trip generation rates, usually the ITE Trip Generation Manual) and the trip length in miles for that specific land use. Trip lengths can be found in other related air quality tools, such as CalEEMod, or may be derived from OCTAM.

4.4.2 Large Project VMT Analysis

For large or multi-use projects, use of the OCTAM traffic forecasting tool is required. For purposes of County review, a project generating 1,000 ADT or more should use the OCTAM traffic forecasting tool. At this level of trip generating, the probability of trip fulfilment expands to an area greater than the immediate project location and may include a greater regional attraction. The OCTAM traffic forecasting tool can more accurately define the select links used and the total VMT generated by the project.

Next, the project generated efficiency rate, or total VMT, depending on project type, is compared to the appropriate significance threshold. **This is either 85 percent of the existing regional average per capita or employment (for the County) for residential and office uses, or no net increase in total VMT for retail or other uses that are consistent with the General Plan.** For those projects that require a General Plan Amendment, 85 percent of existing regional average is appropriate, as the project has yet to be evaluated as part of the County's ultimate land development vision.

If the project VMT (expressed as a per capita or per employee rate or total number) is at or less than the significance threshold, the project is presumed to create a less than significant impact. No further analysis is required. If the project is greater than the significance threshold, mitigation measures are required.

4.5 Mitigation Measures

The applicant is required, per CEQA, to identify feasible mitigation to mitigate the impact created by the project, to a level that is less than significant. Appendices A and B list some ideas for potential mitigation strategies. This is not an exhaustive list of feasible mitigation measures that may be applied to the project. As in previous CEQA practice, the applicant/project proponent will be required to identify mitigation measures to reduce, avoid, or offset the specific project-related impacts identified in an individual environmental document. Thus, the applicant should submit other creative, feasible mitigation for their project. The mitigation measures suggested and the related VMT percentage reduction must be reviewed and either approved or rejected by the County.

If the mitigation measures mitigate the project impact to a less than significant level, no further analysis is required. If the project's VMT impact cannot be fully mitigated, the County may: 1) request the project be redesigned, relocated, or realigned to reduce the VMT impact, or 2) prepare a Statement of Overriding Considerations (SOC) for the transportation impacts associated with the project. All feasible mitigation measures must be assigned to and carried out by the project, even if a SOC is prepared.

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5.0 SIGNIFICANCE THRESHOLDS FOR TRANSPORTATION PROJECTS

Section 15064.3.b.(2) of the Guidelines reads in part:

> *For roadway capacity projects, agencies have the discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements.*

The County may continue to use delay and LOS for transportation projects as long as impacts related to "other applicable requirements" are disclosed. This has generally been interpreted as VMT impacts and other State climate change objectives. These other applicable requirements may be found in other parts of an environmental document (i.e., air quality, GHG), or may be provided in greater detail in the transportation section.

For projects on the State highway system, Caltrans will use and will require sponsoring agencies to use VMT as the CEQA metric, and Caltrans will evaluate the VMT "attributable to the project" (Caltrans Draft VMT-Focused Transportation Impact Study Guide, February 28, 2020). Caltrans' Intergovernmental Review will review environmental documents for capacity-enhancing projects for the County's analysis of VMT change.

The assessment of a transportation project's VMT should disclose the VMT without the project and the difference in VMT with the project. According to the TA, any growth in VMT attributable to the transportation project would result in a significant impact.

The primary difference in these two scenarios (without the project and with the project) to OPR is related to induced growth. Current traffic models have limited abilities to forecast induced growth, as their land use or socioeconomic databases are fixed to a horizon date. OPR refers to a limited set of reports that would indicate elasticities. The most recent major study (Duranton & Turner 2011, p. 24) estimates an elasticity of 1.0, meaning that every 1 percent change in lane miles results in a 1 percent increase in VMT.

The TA presents one method to identify the induced growth, as shown below. This method may be used in Orange County to estimate induced growth attributable to new roadway capacity.

> *To estimate VMT impacts from roadway expansion projects:*
>
> 1. *Determine the total lane-miles over an area that fully captures travel behavior changes resulting from the project (generally the region, but for projects affecting interregional travel look at all affected regions).*
> 2. *Determine the percentage change in total lane miles that will result from the project.*
> 3. *Determine the total existing VMT over that same area.*
> 4. *Multiply the percentage increase in lane miles by the existing VMT, and then multiply that by the elasticity from the induced travel literature:*
>
> *[% increase in lane miles] x [existing VMT] x [elasticity] = [VMT resulting from the project]*

It should be pointed out that OPR assigns this induced growth to induced land use.

As an alternative method, Caltrans has identified a computerized tool that estimates VMT generation from transportation projects. It was developed at the University of California, Davis, and is based on elasticities and the relationship of lane mile additions and growth in VMT. It uses Federal Highway Administration definitions of facility type and ascribes VMT increases to each facility. Output includes increases on million vehicle miles per year. Caltrans is investigating its use for all its VMT analyses of capital projects. It is available for use by local agencies and applicants, and the County may recommend utilization of this tool for calculations.

The TA provides other options to identify induced growth- and project-related VMT. These include:

1. *Employ an expert panel. An expert panel could assess changes to land use development that would likely result from the project. This assessment could then be analyzed by the travel demand model to assess effects on vehicle travel. Induced vehicle travel assessed via this approach should be verified using elasticities found in the academic literature.*

2. Adjust model results to align with the empirical research. *If the travel demand model analysis is performed without incorporating projected land use changes resulting from the project, the assessed vehicle travel should be adjusted upward to account for those land use changes. The assessed VMT after adjustment should fall within the range found in the academic literature.*

3. Employ a land use model, running it iteratively with a travel demand model. *A land use model can be used to estimate the land use effects of a roadway capacity increase, and the traffic patterns that result from the land use change can then be fed back into the travel demand model. The land use model and travel demand model can be iterated to produce an accurate result.*

The TA provides additional guidance, below:

> *Whenever employing a travel demand model to assess induced vehicle travel, any limitation or known lack of sensitivity in the analysis that might cause substantial errors in the VMT estimate (for example, model insensitivity to one of the components of induced VMT described above) should be disclosed and characterized, and a description should be provided on how it could influence the analysis results. A discussion of the potential error or bias should be carried into analyses that rely on the VMT analysis, such as greenhouse gas emissions, air quality, energy, and noise.*

The threshold for significance for a capacity-enhancing roadway project is any additional VMT generated by the project either due to the increased roadway use or as a result of induced growth attributable to the project.

6.0 SIGNIFICANCE THRESHOLDS FOR LAND PLANS

In the TA, the OPR provided guidance on the treatment of CEQA traffic analyses for land use plans. The TA reiterates previous direction regarding individual land use assessments:

- Analyze the VMT outcomes over the full area over which the plan may substantively affect travel patterns (the definition of region).

- VMT should be counted in full rather than split between origins and destinations (the full impact of the project VMT).

The TA provides a single sentence as consideration for land use plans. It states, *"A general plan, area plan, or community plan may have a significant impact on transportation if proposed new residential, office or retail land uses would in aggregate exceed the respective thresholds recommended above."* This recommendation refers to 85 percent of the existing city or regional average, and no net gain for residential, office, and retail land uses.

OPR is recommending a focus on specific trip purposes (i.e., home-based trips for residential projects and work-based trips for office projects). Depending on the modeling platform, at least four other trip types are recognized as contributors to large-scale plan-level analyses. Home-based origins will have interactions with other non-work-based destinations. Therefore, if home-based trips are the focus of a plan-level assessment, a great deal of VMT would not be accounted for in the estimation of total VMT.

To assess a land plan, use of a traffic-forecasting tool is recommended. The total VMT for the plan should be identified for all trip types and all potential VMT contributors within the plan area. Similar traffic model runs should be conducted for the existing base year and the horizon year with No Project.

The SB 375 process and the Regional Targets Advisory Committee GHG goal setting has established a baseline GHG emissions reduction that local Metropolitan Planning Organizations (MPOs) and Regional Transportation Planning Agencies (RTPAs) can achieve. These achievements are provided in the integration of land use planning and transportation, not solely through the imposition of regulation on passenger cars and light-duty trucks. The CARB reviews the GHG reduction strategies and has approved the most recent round of GHG emission reductions for MPOs and RTPAs around the State.

Other legislative mandates and State policies speak to GHG reduction targets. A sample of these include:

- Assembly Bill 32 (2006) requires statewide GHG emissions reductions to 1990 levels by 2020 and continued reductions beyond 2020.

- SB 32 (2016) requires at least a 40 percent reduction in GHG emissions from 1990 levels by 2030.

- Executive Order (EO) B-30-15 (2015) sets a GHG emissions reduction target of 40 percent below 1990 levels by 2030.

- EO S-3-05 (2005) sets a GHG emissions reduction target of 80 percent below 1990 levels by 2050.

- EO B-16-12 (2012) specifies a GHG emissions reduction target of 80 percent below 1990 levels by 2050 specifically for transportation.

Guidelines Section 15064.3(b)(4) states (in part) the following:

> *A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household, or in any other measure.*

Therefore, the recommended methodology for conducting VMT assessments for land plans is to compare the existing VMT per capita for the land plan area with the expected horizon year VMT per service population (population and employment). The recommended target is to achieve a lower VMT per service population in the horizon year with the proposed land plan than occurs for the existing condition.

7.0 MITIGATION STRATEGIES

When a significant CEQA impact is identified according to the thresholds described above, the project proponent will be required to identify feasible mitigation measures in order to reduce, avoid, or offset the impact. Although previous vehicle LOS impacts could be mitigated with location-specific vehicle level of service improvements, VMT impacts likely require mitigation of regional impacts through more behavioral changes. Enforcement of mitigation measures will still be subject to the mitigation monitoring requirements of CEQA, as well as the regular police powers of the County. These measures can also be incorporated as a part of plans, policies, regulations, or project designs.

7.1 Definition of Mitigation

Section 15370 of the Guidelines defines mitigations as follows:

> *"Mitigation" includes:*
>
> *a. Avoiding the impact altogether by not taking a certain action or parts of an action.*
>
> *b. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.*
>
> *c. Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment.*
>
> *d. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.*
>
> *e. Compensating for the impact by replacing or providing substitute resources or environments, including through permanent protection of such resources in the form of conservation easements.*

Section 15097 of the Guidelines states that "the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it has imposed to mitigate or avoid significant environmental effects."

VMT mitigations are not necessarily physical improvements; rather, they are complex in nature and will significantly depend on changes in human behavior.

Section 21099 (b) (4) of the PRC states, "This subdivision [requiring a new transportation metric under CEQA] does not preclude the application of local general plan policies, zoning codes, conditions of approval, thresholds, or any other planning requirements pursuant to the police power or any other authority." Thus, despite the fact that automobile delay will no longer be considered a significant impact under CEQA, the County can still require projects to meet the LOS standards designated in its zoning code or general plan. Many projects will likely still be required to propose LOS improvements for congestion relief in addition to VMT strategies as CEQA mitigation measures.

7.2 Mitigation Measures and Project Alternatives

7.2.1 Land Development Projects and Community/General Plans

Mitigations and project alternatives for VMT impacts have been suggested by the OPR and are included in the TA. VMT mitigation can be extremely diverse and can be classified under several categories such as land use/location, road pricing, transit improvements, commute trip reduction strategies, and parking pricing/policy. Improvements related to VMT reduction strategies have been quantified in sources such as the California Air Pollution Control Officers Association (CAPCOA) report *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA Green Book) and CARB sources and are generally presented in wide ranges of potential VMT reduction percentages.

Appendix B provides a brief menu of the different potentially applicable VMT mitigation measures and project alternatives stated in the CAPCOA Green Book (only those strategies directly attributed to transportation) and the OPR TA for land development projects. This discussion does not present an exhaustive list of feasible mitigation measures that may be applied to a project. As in previous CEQA practice, the applicant/project proponent will be required to identify mitigation measures to the County to reduce, avoid, or offset the specific project-related impacts identified in an individual environmental document.

As additional mitigation measures are developed to offset VMT impacts in the future for the Guidelines process, linkages between the strategy and the incremental effect and quantified offset must be made. This can be based on other sources' observations and measurements or County experience in these practices. The key to mitigation is to base its efficacy on real and substantial evidence.

7.2.2 Transportation Projects

Although OPR provides detailed guidance on how to assess induced-growth impacts associated with transportation projects, it leaves the subject of mitigation measures vague. Only four strategies are suggested as mitigation measures:

- Tolling new lanes to encourage carpools and fund transit improvements
- Converting existing general-purpose lanes to HOV or HOT lanes
- Implementing or funding off-site travel demand management
- Implementing Intelligent Transportation Systems strategies to improve passenger throughput on existing lanes

No quantified reduction percentage is allocated to these strategies, and LSA could find no substantial evidence that would provide guidance to levels of significance after implementation of these strategies. Review of the four recommended strategies suggests that OPR is directing strategies away from general-purpose mixed-flow lanes on expressways, freeways, and arterial highways. Inasmuch as these are the project descriptions and Purpose and Need, the project intent and the project mitigation may be at odds. The County may be subject to an SOC for the capital project VMT impact.

APPENDIX A

TECHNICAL ADVISORY ON EVALUATING TRANSPORTATION IMPACTS IN CEQA (OPR, DECEMBER 2018)

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TECHNICAL ADVISORY

ON EVALUATING TRANSPORTATION IMPACTS IN CEQA

December 2018

Contents

A. Introduction

This technical advisory is one in a series of advisories provided by the Governor's Office of Planning and Research (OPR) as a service to professional planners, land use officials, and CEQA practitioners. OPR issues technical assistance on issues that broadly affect the practice of land use planning and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). (Gov. Code, § 65040, subds. (g), (l), (m).) The purpose of this document is to provide advice and recommendations, which agencies and other entities may use at their discretion. This document does not alter lead agency discretion in preparing environmental documents subject to CEQA. This document should not be construed as legal advice.

Senate Bill 743 (Steinberg, 2013), which was codified in Public Resources Code section 21099, required changes to the guidelines implementing CEQA (CEQA Guidelines) (Cal. Code Regs., Title 14, Div. 6, Ch. 3, § 15000 et seq.) regarding the analysis of transportation impacts. As one appellate court recently explained: "During the last 10 years, the Legislature has charted a course of long-term sustainability based on denser infill development, reduced reliance on individual vehicles and improved mass transit, all with the goal of reducing greenhouse gas emissions. Section 21099 is part of that strategy . . . ." (*Covina Residents for Responsible Development v. City of Covina* (2018) 21 Cal.App.5th 712, 729.) Pursuant to Section 21099, the criteria for determining the significance of transportation impacts must "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." (*Id.*, subd. (b)(1); see generally, adopted CEQA Guidelines, § 15064.3, subd. (b) [Criteria for Analyzing Transportation Impacts].) To that end, in developing the criteria, OPR has proposed, and the California Natural Resources Agency (Agency) has certified and adopted, changes to the CEQA Guidelines that identify vehicle miles traveled (VMT) as the most appropriate metric to evaluate a project's transportation impacts. With the California Natural Resources Agency's certification and adoption of the changes to the CEQA Guidelines, automobile delay, as measured by "level of service" and other similar metrics, generally no longer constitutes a significant environmental effect under CEQA. (Pub. Resources Code, § 21099, subd. (b)(3).)

This advisory contains technical recommendations regarding assessment of VMT, thresholds of significance, and mitigation measures. Again, OPR provides this Technical Advisory as a resource for the public to use at their discretion. OPR is not enforcing or attempting to enforce any part of the recommendations contained herein. (Gov. Code, § 65035 ["It is not the intent of the Legislature to vest in the Office of Planning and Research any direct operating or regulatory powers over land use, public works, or other state, regional, or local projects or programs."].)

This December 2018 technical advisory is an update to the advisory it published in April 2018. OPR will continue to monitor implementation of these new provisions and may update or supplement this advisory in response to new information and advancements in modeling and methods.

B. Background

VMT and Greenhouse Gas Emissions Reduction. Senate Bill 32 (Pavley, 2016) requires California to reduce greenhouse gas (GHG) emissions 40 percent below 1990 levels by 2030, and Executive Order B-16-12 provides a target of 80 percent below 1990 emissions levels for the transportation sector by 2050. The transportation sector has three major means of reducing GHG emissions: increasing vehicle efficiency, reducing fuel carbon content, and reducing the amount of vehicle travel. The California Air Resources Board (CARB) has provided a path forward for achieving these emissions reductions from the transportation sector in its 2016 Mobile Source Strategy. CARB determined that it will not be possible to achieve the State's 2030 and post-2030 emissions goals without reducing VMT growth. Further, in its 2018 Progress Report on California's Sustainable Communities and Climate Protection Act, CARB found that despite the State meeting its 2020 climate goals, "emissions from statewide passenger vehicle travel per capita [have been] increasing and going in the wrong direction," and "California cannot meet its [long-term] climate goals without curbing growth in single-occupancy vehicle activity."[1] CARB also found that "[w]ith emissions from the transportation sector continuing to rise despite increases in fuel efficiency and decreases in the carbon content of fuel, California will not achieve the necessary greenhouse gas emissions reductions to meet mandates for 2030 and beyond without significant changes to how communities and transportation systems are planned, funded, and built."[2]

Thus, to achieve the State's long-term climate goals, California needs to reduce per capita VMT. This can occur under CEQA through VMT mitigation. Half of California's GHG emissions come from the transportation sector[3], therefore, reducing VMT is an effective climate strategy, which can also result in co-benefits.[4] Furthermore, without early VMT mitigation, the state may follow a path that meets GHG targets in the early years, but finds itself poorly positioned to meet more stringent targets later. For example, in absence of VMT analysis and mitigation in CEQA, lead agencies might rely upon verifiable offsets for GHG mitigation, ignoring the longer-term climate change impacts resulting from land use development and infrastructure investment decisions. As stated in CARB's 2017 Scoping Plan:

> "California's future climate strategy will require increased focus on integrated land use planning to support livable, transit-connected communities, and conservation of agricultural and other lands. Accommodating population and economic growth through travel- and energy-efficient land use provides GHG-efficient growth, reducing GHGs from both transportation and building energy use. GHGs can be further reduced at the project level through implementing energy-efficient construction and travel demand management approaches."[5] (*Id.* at p. 102.)

[1] California Air Resources Board (Nov. 2018) *2018 Progress Report on California's Sustainable Communities and Climate Protection Act*, pp. 4, 5, available at https://ww2.arb.ca.gov/sites/default/files/2018-11/Final2018Report_SB150_112618_02_Report.pdf.
[2] *Id.*, p. 28.
[3] See https://ca50million.ca.gov/transportation/
[4] Fang et al. (2017) *Cutting Greenhouse Gas Emissions Is Only the Beginning: A Literature Review of the Co-Benefits of Reducing Vehicle Miles Traveled*.
[5] California Air Resources Board (Nov. 2017) *California's 2017 Climate Change Scoping Plan*, p. 102, available at https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf.

In light of this, the 2017 Scoping Plan describes and quantifies VMT reductions needed to achieve our long-term GHG emissions reduction goals, and specifically points to the need for statewide deployment of the VMT metric in CEQA:

> "Employing VMT as the metric of transportation impact statewide will help to ensure GHG reductions planned under SB 375 will be achieved through on-the-ground development, and will also play an important role in creating the additional GHG reductions needed beyond SB 375 across the State. Implementation of this change will rely, in part, on local land use decisions to reduce GHG emissions associated with the transportation sector, both at the project level, and in long-term plans (including general plans, climate action plans, specific plans, and transportation plans) and supporting sustainable community strategies developed under SB 375."[6]

VMT and Other Impacts to Health and Environment. VMT mitigation also creates substantial benefits (sometimes characterized as "co-benefits" to GHG reduction) in both in the near-term and the long-term. Beyond GHG emissions, increases in VMT also impact human health and the natural environment. Human health is impacted as increases in vehicle travel lead to more vehicle crashes, poorer air quality, increases in chronic diseases associated with reduced physical activity, and worse mental health. Increases in vehicle travel also negatively affect other road users, including pedestrians, cyclists, other motorists, and many transit users. The natural environment is impacted as higher VMT leads to more collisions with wildlife and fragments habitat. Additionally, development that leads to more vehicle travel also tends to consume more energy, water, and open space (including farmland and sensitive habitat). This increase in impermeable surfaces raises the flood risk and pollutant transport into waterways.[7]

VMT and Economic Growth. While it was previously believed that VMT growth was a necessary component of economic growth, data from the past two decades shows that economic growth is possible without a concomitant increase in VMT. (Figure 1.) Recent research shows that requiring development projects to mitigate LOS may actually reduce accessibility to destinations and impede economic growth.[8,9]

[6] *Id.* at p. 76.
[7] Fang et al. (2017) *Cutting Greenhouse Gas Emissions Is Only the Beginning: A Literature Review of the Co-Benefits of Reducing Vehicle Miles Traveled*, available at https://ncst.ucdavis.edu/wp-content/uploads/2017/03/NCST-VMT-Co-Benefits-White-Paper_Fang_March-2017.pdf.
[8] Haynes et al. (Sept. 2015) *Congested Development: A Study of Traffic Delays, Access, and Economic Activity in Metropolitan Los Angeles*, available at http://www.its.ucla.edu/wp-content/uploads/sites/6/2015/11/Haynes_Congested-Development_1-Oct-2015_final.pdf.
[9] Osman et al. (Mar. 2016) *Not So Fast: A Study of Traffic Delays, Access, and Economic Activity in the San Francisco Bay Area*, available at http://www.its.ucla.edu/wp-content/uploads/sites/6/2016/08/Taylor-Not-so-Fast-04-01-2016_final.pdf.

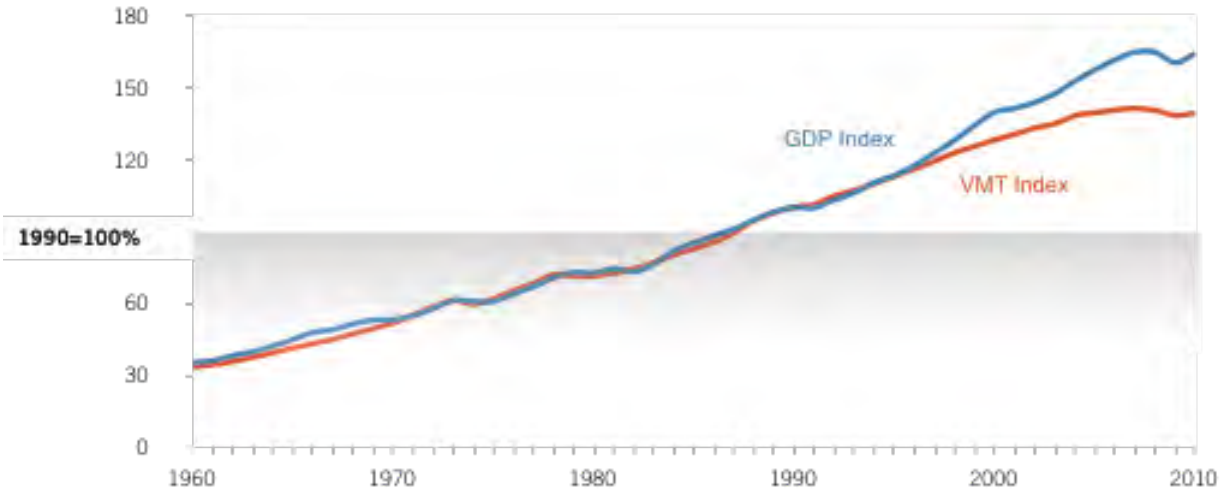

Figure 1. Kooshian and Winkelman (2011) *VMT and Gross Domestic Product (GDP), 1960-2010*.

C. Technical Considerations in Assessing Vehicle Miles Traveled

Many practitioners are familiar with accounting for VMT in connection with long-range planning, or as part of the CEQA analysis of a project's greenhouse gas emissions or energy impacts. This document provides technical information on how to assess VMT as part of a transportation impacts analysis under CEQA. Appendix 1 provides a description of which VMT to count and options on how to count it. Appendix 2 provides information on induced travel resulting from roadway capacity projects, including the mechanisms giving rise to induced travel, the research quantifying it, and information on additional approaches for assessing it.

1. Recommendations Regarding Methodology

Proposed Section 15064.3 explains that a "lead agency may use models to estimate a project's vehicle miles traveled . . . ." CEQA generally defers to lead agencies on the choice of methodology to analyze impacts. (*Santa Monica Baykeeper v. City of Malibu* (2011) 193 Cal.App.4th 1538, 1546; see *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 409 ["the issue is not whether the studies are irrefutable or whether they could have been better" … rather, the "relevant issue is only whether the studies are sufficiently credible to be considered" as part of the lead agency's overall evaluation].) This section provides suggestions to lead agencies regarding methodologies to analyze VMT associated with a project.

Vehicle Types. Proposed Section 15064.3, subdivision (a), states, "For the purposes of this section, 'vehicle miles traveled' refers to the amount and distance of automobile travel attributable to a project." Here, the term "automobile" refers to on-road passenger vehicles, specifically cars and light trucks. Heavy-duty truck VMT could be included for modeling convenience and ease of calculation (for example, where models or data provide combined auto and heavy truck VMT). For an apples-to-apples

comparison, vehicle types considered should be consistent across project assessment, significance thresholds, and mitigation.

Residential and Office Projects. Tour- and trip-based approaches[10] offer the best methods for assessing VMT from residential/office projects and for comparing those assessments to VMT thresholds. These approaches also offer the most straightforward methods for assessing VMT reductions from mitigation measures for residential/office projects. When available, tour-based assessment is ideal because it captures travel behavior more comprehensively. But where tour-based tools or data are not available for all components of an analysis, a trip-based assessment of VMT serves as a reasonable proxy.

Models and methodologies used to calculate thresholds, estimate project VMT, and estimate VMT reduction due to mitigation should be comparable. For example:

- A tour-based assessment of project VMT should be compared to a tour-based threshold, or a trip-based assessment to a trip-based VMT threshold.
- Where a travel demand model is used to determine thresholds, the same model should also be used to provide trip lengths as part of assessing project VMT.
- Where only trip-based estimates of VMT reduction from mitigation are available, a trip-based threshold should be used, and project VMT should be assessed in a trip-based manner.

When a trip-based method is used to analyze a residential project, the focus can be on home-based trips. Similarly, when a trip-based method is used to analyze an office project, the focus can be on home-based work trips.

When tour-based models are used to analyze an office project, either employee work tour VMT or VMT from all employee tours may be attributed to the project. This is because workplace location influences overall travel. For consistency, the significance threshold should be based on the same metric: either employee work tour VMT or VMT from all employee tours.

For office projects that feature a customer component, such as a government office that serves the public, a lead agency can analyze the customer VMT component of the project using the methodology for retail development (see below).

Retail Projects. Generally, lead agencies should analyze the effects of a retail project by assessing the change in total VMT[11] because retail projects typically re-route travel from other retail destinations. A retail project might lead to increases or decreases in VMT, depending on previously existing retail travel patterns.

[10] See Appendix 1, *Considerations About Which VMT to Count,* for a description of these approaches.
[11] See Appendix 1, *Considerations About Which VMT to Count, "*Assessing Change in Total VMT" section, for a description of this approach.

Considerations for All Projects. Lead agencies should not truncate any VMT analysis because of jurisdictional or other boundaries, for example, by failing to count the portion of a trip that falls outside the jurisdiction or by discounting the VMT from a trip that crosses a jurisdictional boundary. CEQA requires environmental analyses to reflect a "good faith effort at full disclosure." (CEQA Guidelines, § 15151.) Thus, where methodologies exist that can estimate the full extent of vehicle travel from a project, the lead agency should apply them to do so. Where those VMT effects will grow over time, analyses should consider both a project's short-term and long-term effects on VMT.

Combining land uses for VMT analysis is not recommended. Different land uses generate different amounts of VMT, so the outcome of such an analysis could depend more on the mix of uses than on their travel efficiency. As a result, it could be difficult or impossible for a lead agency to connect a significance threshold with an environmental policy objective (such as a target set by law), inhibiting the CEQA imperative of identifying a project's significant impacts and providing mitigation where feasible. Combining land uses for a VMT analysis could streamline certain mixes of uses in a manner disconnected from policy objectives or environmental outcomes. Instead, OPR recommends analyzing each use separately, or simply focusing analysis on the dominant use, and comparing each result to the appropriate threshold. Recommendations for methods of analysis and thresholds are provided below. In the analysis of each use, a mixed-use project should take credit for internal capture.

Any project that includes in its geographic bounds a portion of an existing or planned Transit Priority Area (i.e., the project is within a ½ mile of an existing or planned major transit stop or an existing stop along a high quality transit corridor) may employ VMT as its primary metric of transportation impact for the entire project. (See Pub. Resources Code, § 21099, subds. (a)(7), (b)(1).)

Cumulative Impacts. A project's cumulative impacts are based on an assessment of whether the "incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." (Pub. Resources Code, § 21083, subd. (b)(2); see CEQA Guidelines, § 15064, subd. (h)(1).) When using an absolute VMT metric, i.e., total VMT (as recommended below for retail and transportation projects), analyzing the combined impacts for a cumulative impacts analysis may be appropriate. However, metrics such as VMT per capita or VMT per employee, i.e., metrics framed in terms of efficiency (as recommended below for use on residential and office projects), cannot be summed because they employ a denominator. A project that falls below an efficiency-based threshold that is aligned with long-term environmental goals and relevant plans would have no cumulative impact distinct from the project impact. Accordingly, a finding of a less-than-significant project impact would imply a less than significant cumulative impact, and vice versa. This is similar to the analysis typically conducted for greenhouse gas emissions, air quality impacts, and impacts that utilize plan compliance as a threshold of significance. (See *Center for Biological Diversity v. Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 219, 223; CEQA Guidelines, § 15064, subd. (h)(3).)

D. General Principles to Guide Consideration of VMT

SB 743 directs OPR to establish specific "criteria for determining the significance of transportation impacts of projects[.]" (Pub. Resources Code, § 21099, subd. (b)(1).) In establishing this criterion, OPR was guided by the general principles contained within CEQA, the CEQA Guidelines, and applicable case law.

To assist in the determination of significance, many lead agencies rely on "thresholds of significance." The CEQA Guidelines define a "threshold of significance" to mean "an identifiable **quantitative, qualitative[12] or performance level** of a particular environmental effect, non-compliance with which means the effect will ***normally*** be determined to be significant by the agency and compliance with which means the effect ***normally*** will be determined to be less than significant." (CEQA Guidelines, § 15064.7, subd. (a) (emphasis added).) Lead agencies have discretion to develop and adopt their own, or rely on thresholds recommended by other agencies, "provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence." (*Id*. at subd. (c); *Save Cuyama Valley v. County of Santa Barbara* (2013) 213 Cal.App.4th 1059, 1068.) Substantial evidence means "enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached." (*Id*. at § 15384 (emphasis added); *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1108-1109.)

Additionally, the analysis leading to the determination of significance need not be perfect. The CEQA Guidelines describe the standard for adequacy of environmental analyses:

> An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to **make a decision which intelligently takes account of environmental consequences**. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is **reasonably feasible**. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The **courts have looked not for perfection** but for **adequacy**, **completeness**, and a **good faith effort** at full disclosure.

(CEQA Guidelines, § 15151 (emphasis added).)

These general principles guide OPR's recommendations regarding thresholds of significance for VMT set forth below.

[12] Generally, qualitative analyses should only be conducted when methods do not exist for undertaking a quantitative analysis.

E. Recommendations Regarding Significance Thresholds

As noted above, lead agencies have the discretion to set or apply their own thresholds of significance. (*Center for Biological Diversity v. California Dept. of Fish & Wildlife* (2015) 62 Cal.4th 204, 218-223 [lead agency had discretion to use compliance with AB 32's emissions goals as a significance threshold]; *Save Cuyama Valley v. County of Santa Barbara* (2013) 213 Cal.App.4th at p. 1068.) However, Section 21099 of the Public Resources Code states that the criteria for determining the significance of transportation impacts must promote: (1) reduction of greenhouse gas emissions; (2) development of multimodal transportation networks; and (3) a diversity of land uses. It further directed OPR to prepare and develop criteria for determining significance. (Pub. Resources Code, § 21099, subd. (b)(1).) This section provides OPR's suggested thresholds, as well as considerations for lead agencies that choose to adopt their own thresholds.

The VMT metric can support the three statutory goals: "the reduction of greenhouse gas emissions, the development of multimodal transportation networks, ***and*** a diversity of land uses." (Pub. Resources Code, § 21099, subd. (b)(1), emphasis added.) However, in order for it to promote and support all three, lead agencies should select a significance threshold that aligns with state law on all three. State law concerning the development of multimodal transportation networks and diversity of land uses requires planning for and prioritizing increases in complete streets and infill development, but does not mandate a particular depth of implementation that could translate into a particular threshold of significance. Meanwhile, the State has clear quantitative targets for GHG emissions reduction set forth in law and based on scientific consensus, and the depth of VMT reduction needed to achieve those targets has been quantified. Tying VMT thresholds to GHG reduction also supports the two other statutory goals. Therefore, to ensure adequate analysis of transportation impacts, OPR recommends using quantitative VMT thresholds linked to GHG reduction targets when methods exist to do so.

Various legislative mandates and state policies establish quantitative greenhouse gas emissions reduction targets. For example:

- Assembly Bill 32 (2006) requires statewide GHG emissions reductions to 1990 levels by 2020 and continued reductions beyond 2020.

- Senate Bill 32 (2016) requires at least a 40 percent reduction in GHG emissions from 1990 levels by 2030.

- Pursuant to Senate Bill 375 (2008), the California Air Resources Board GHG emissions reduction targets for metropolitan planning organizations (MPOs) to achieve based on land use patterns and transportation systems specified in Regional Transportation Plans and Sustainable Community Strategies (RTP/SCS). Current targets for the State's largest MPOs call for a 19 percent reduction in GHG emissions from cars and light trucks from 2005 emissions levels by 2035.

- Executive Order B-30-15 (2015) sets a GHG emissions reduction target of 40 percent below 1990 levels by 2030.

- Executive Order S-3-05 (2005) sets a GHG emissions reduction target of 80 percent below 1990 levels by 2050.

- Executive Order B-16-12 (2012) specifies a GHG emissions reduction target of 80 percent below 1990 levels by 2050 specifically for transportation.

- Executive Order B-55-18 (2018) established an additional statewide goal of achieving carbon neutrality as soon as possible, but no later than 2045, and maintaining net negative emissions thereafter. It states, "The California Air Resources Board shall work with relevant state agencies to develop a framework for implementation and accounting that tracks progress toward this goal."

- Senate Bill 391 requires the California Transportation Plan to support 80 percent reduction in GHGs below 1990 levels by 2050.

- The *California Air Resources Board Mobile Source Strategy* (2016) describes California's strategy for containing air pollutant emissions from vehicles, and quantifies VMT growth compatible with achieving state targets.

- The California Air Resources Board's *2017 Climate Change Scoping Plan Update: The Strategy for Achieving California's 2030 Greenhouse Gas Target* describes California's strategy for containing GHG emissions from vehicles, and quantifies VMT growth compatible with achieving state targets.

Considering these various targets, the California Supreme Court observed:

> Meeting our statewide reduction goals does not preclude all new development. Rather, the Scoping Plan … assumes continued growth and depends on increased efficiency and conservation in land use and transportation from all Californians.

(*Center for Biological Diversity v. California Dept. of Fish & Wildlife*, *supra*, 62 Cal.4th at p. 220.) Indeed, the Court noted that when a lead agency uses consistency with climate goals as a way to determine significance, particularly for long-term projects, the lead agency must consider the project's effect on meeting long-term reduction goals. (*Ibid*.) And more recently, the Supreme Court stated that "CEQA requires public agencies . . . to ensure that such analysis stay in step with evolving scientific knowledge and state regulatory schemes." (*Cleveland National Forest Foundation v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497, 504.)

Meeting the targets described above will require substantial reductions in existing VMT per capita to curb GHG emissions and other pollutants. But targets for overall GHG emissions reduction do not translate directly into VMT thresholds for individual projects for many reasons, including:

- Some, but not all, of the emissions reductions needed to achieve those targets could be accomplished by other measures, including increased vehicle efficiency and decreased fuel carbon content. The CARB's *First Update to the Climate Change Scoping Plan* explains:

"Achieving California's long-term criteria pollutant and GHG emissions goals will require four strategies to be employed: (1) improve vehicle efficiency and develop zero emission technologies, (2) reduce the carbon content of fuels and provide market support to get these lower-carbon fuels into the marketplace, (3) **plan and build communities to reduce vehicular GHG emissions and provide more transportation options, and (4) improve the efficiency and throughput of existing transportation systems.**"[13] CARB's *2018 Progress Report on California's Sustainable Communities and Climate Protection Act* states on page 28 that "California cannot meet its climate goals without curbing growth in single-occupancy vehicle activity." In other words, vehicle efficiency and better fuels are necessary, but insufficient, to address the GHG emissions from the transportation system. Land use patterns and transportation options also will need to change to support reductions in vehicle travel/VMT.

- New land use projects alone will not sufficiently reduce per-capita VMT to achieve those targets, nor are they expected to be the sole source of VMT reduction.

- Interactions between land use projects, and also between land use and transportation projects, existing and future, together affect VMT.

- Because location within the region is the most important determinant of VMT, in some cases, streamlining CEQA review of projects in travel efficient locations may be the most effective means of reducing VMT.

- When assessing climate impacts of some types of land use projects, use of an efficiency metric (e.g., per capita, per employee) may provide a better measure of impact than an absolute numeric threshold. (*Center for Biological Diversity*, *supra*.)

Public Resources Code section 21099 directs OPR to propose criteria for determining the significance of transportation impacts. In this Technical Advisory, OPR provides its recommendations to assist lead agencies in selecting a significance threshold that may be appropriate for their particular projects. While OPR's Technical Advisory is not binding on public agencies, CEQA allows lead agencies to "consider thresholds of significance . . . recommended by other public agencies, provided the decision to adopt those thresholds is supported by substantial evidence." (CEQA Guidelines, § 15064.7, subd. (c).) Based on OPR's extensive review of the applicable research, and in light of an assessment by the California Air Resources Board quantifying the need for VMT reduction in order to meet the State's long-term climate goals, **OPR recommends that a per capita or per employee VMT that is fifteen percent below that of existing development may be a reasonable threshold**.

Fifteen percent reductions in VMT are achievable at the project level in a variety of place types.[14]

Moreover, a fifteen percent reduction is consistent with SB 743's direction to OPR to select a threshold that will help the State achieve its climate goals. As described above, section 21099 states that the

[13] California Air Resources Board (May 2014) *First Update to the Climate Change Scoping Plan*, p. 46 (emphasis added).
[14] CAPCOA (2010) *Quantifying Greenhouse Gas Mitigation Measures*, p. 55, available at http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

criteria for determining significance must "promote the reduction in greenhouse gas emissions." In its document *California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*[15], CARB assesses VMT reduction per capita consistent with its evidence-based modeling scenario that would achieve State climate goals of 40 percent GHG emissions reduction from 1990 levels by 2030 and 80 percent GHG emissions reduction levels from 1990 by 2050. Applying California Department of Finance population forecasts, CARB finds per-capita light-duty vehicle travel would need to be approximately 16.8 percent lower than existing, and overall per-capita vehicle travel would need to be approximately 14.3 percent lower than existing levels under that scenario. Below these levels, a project could be considered low VMT and would, on that metric, be consistent with 2017 Scoping Plan Update assumptions that achieve climate state climate goals.

CARB finds per capita vehicle travel would need to be kept below what today's policies and plans would achieve.

CARB's assessment is based on data in the 2017 Scoping Plan Update and 2016 Mobile Source Strategy. In those documents, CARB previously examined the relationship between VMT and the state's GHG emissions reduction targets. The Scoping Plan finds:

> "While the State can do more to accelerate and incentivize these local decisions, local actions that reduce VMT are also necessary to meet transportation sector-specific goals and achieve the 2030 target under SB 32. Through developing the Scoping Plan, CARB staff is more convinced than ever that, in addition to achieving GHG reductions from cleaner fuels and vehicles, California must also reduce VMT. Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward needed reductions, but alone will not provide the VMT growth reductions needed; there is a gap between what SB 375 can provide and what is needed to meet the State's 2030 and 2050 goals."[16]

Note that, at present, consistency with RTP/SCSs does not necessarily lead to a less-than-significant VMT impact.[17] As the Final 2017 Scoping Plan Update states,

> VMT reductions are necessary to achieve the 2030 target and must be part of any strategy evaluated in this Plan. Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward this goal, but alone will not provide all of the VMT growth reductions that will be needed. There is a gap between what SB 375 can provide and what is needed to meet the State's 2030 and 2050 goals."[18]

[15] California Air Resources Board (Jan. 2019) *California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*, available at https://ww2.arb.ca.gov/resources/documents/carb-2017-scoping-plan-identified-vmt-reductions-and-relationship-state-climate.
[16] California Air Resources Board (Nov. 2017) *California's 2017 Climate Change Scoping Plan*, p. 101.
[17] California Air Resources Board (Feb. 2018) *Updated Final Staff Report: Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets*, Figure 3, p. 35, available at https://www.arb.ca.gov/cc/sb375/sb375_target_update_final_staff_report_feb2018.pdf.
[18] California Air Resources Board (Nov. 2017) *California's 2017 Climate Change Scoping Plan*, p. 75.

Also, in order to capture the full effects of induced travel resulting from roadway capacity projects, an RTP/SCS would need to include an assessment of land use effects of those projects, and the effects of those land uses on VMT. (See section titled "*Estimating VMT Impacts from Transportation Projects"* below.) RTP/SCSs typically model VMT using a collaboratively-developed land use "vision" for the region's land use, rather than studying the effects on land use of the proposed transportation investments.

In summary, achieving 15 percent lower per capita (residential) or per employee (office) VMT than existing development is both generally achievable and is supported by evidence that connects this level of reduction to the State's emissions goals.

1. Screening Thresholds for Land Use Projects

Many agencies use "screening thresholds" to quickly identify when a project should be expected to cause a less-than-significant impact without conducting a detailed study. (See e.g., CEQA Guidelines, §§ 15063(c)(3)(C), 15128, and Appendix G.) As explained below, this technical advisory suggests that lead agencies may screen out VMT impacts using project size, maps, transit availability, and provision of affordable housing.

Screening Threshold for Small Projects

Many local agencies have developed screening thresholds to indicate when detailed analysis is needed. Absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with a Sustainable Communities Strategy (SCS) or general plan, projects that generate or attract fewer than 110 trips per day[19] generally may be assumed to cause a less-than-significant transportation impact.

Map-Based Screening for Residential and Office Projects

Residential and office projects that locate in areas with low VMT, and that incorporate similar features (i.e., density, mix of uses, transit accessibility), will tend to exhibit similarly low VMT. Maps created with VMT data, for example from a travel survey or a travel demand model, can illustrate areas that are

[19] CEQA provides a categorical exemption for existing facilities, including additions to existing structures of up to 10,000 square feet, so long as the project is in an area where public infrastructure is available to allow for maximum planned development and the project is not in an environmentally sensitive area. (CEQA Guidelines, § 15301, subd. (e)(2).) Typical project types for which trip generation increases relatively linearly with building footprint (i.e., general office building, single tenant office building, office park, and business park) generate or attract an additional 110-124 trips per 10,000 square feet. Therefore, absent substantial evidence otherwise, it is reasonable to conclude that the addition of 110 or fewer trips could be considered not to lead to a significant impact.

currently below threshold VMT (see recommendations below). Because new development in such locations would likely result in a similar level of VMT, such maps can be used to screen out residential and office projects from needing to prepare a detailed VMT analysis.

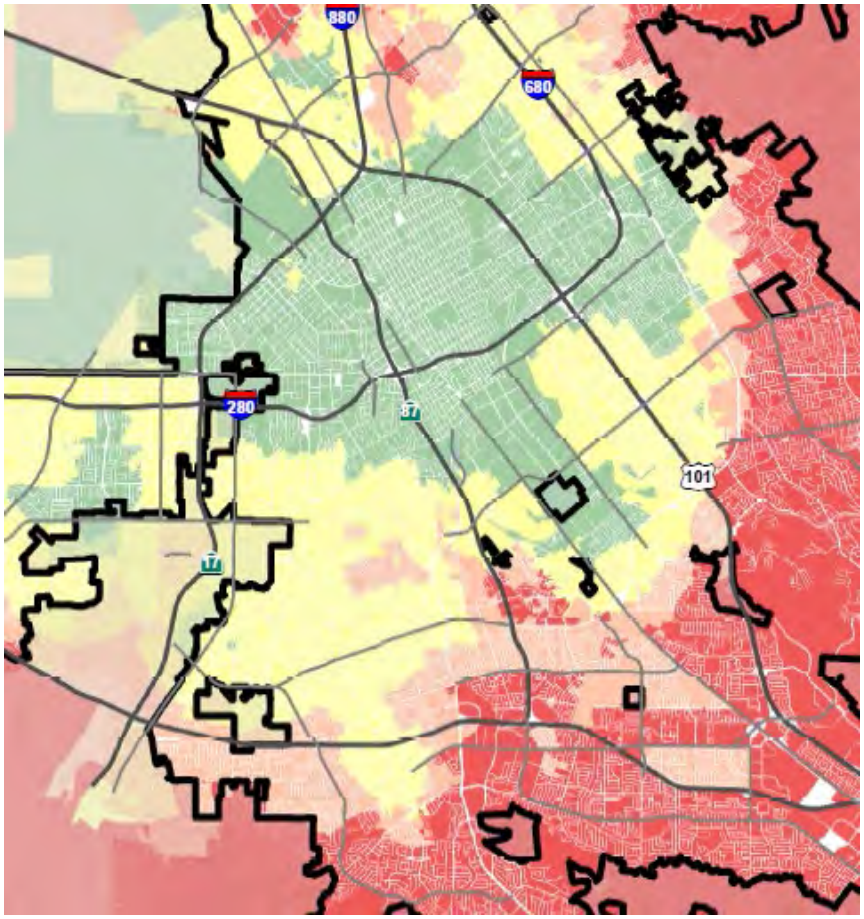

Figure 2. Example map of household VMT that could be used to delineate areas eligible to receive streamlining for VMT analysis. (Source: City of San José, Department of Transportation, draft output of City Transportation Model.)

Presumption of Less Than Significant Impact Near Transit Stations

Proposed CEQA Guideline Section 15064.3, subdivision (b)(1), states that lead agencies generally should presume that certain projects (including residential, retail, and office projects, as well as projects that are a mix of these uses) proposed within ½ mile of an existing major transit stop[20] or an existing stop

[20] Pub. Resources Code, § 21064.3 ("'Major transit stop' means a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods.").

along a high quality transit corridor[21] will have a less-than-significant impact on VMT. This presumption would not apply, however, if project-specific or location-specific information indicates that the project will still generate significant levels of VMT. For example, the presumption might not be appropriate if the project:

- Has a Floor Area Ratio (FAR) of less than 0.75
- Includes more parking for use by residents, customers, or employees of the project than required by the jurisdiction (if the jurisdiction requires the project to supply parking)
- Is inconsistent with the applicable Sustainable Communities Strategy (as determined by the lead agency, with input from the Metropolitan Planning Organization)
- Replaces affordable residential units with a smaller number of moderate- or high-income residential units

A project or plan near transit which replaces affordable residential units[22] with a smaller number of moderate- or high-income residential units may increase overall VMT because the increase in VMT of displaced residents could overwhelm the improvements in travel efficiency enjoyed by new residents.[23]

If any of these exceptions to the presumption might apply, the lead agency should conduct a detailed VMT analysis to determine whether the project would exceed VMT thresholds (see below).

Presumption of Less Than Significant Impact for Affordable Residential Development

Adding affordable housing to infill locations generally improves jobs-housing match, in turn shortening commutes and reducing VMT.[24,25] Further, "… low-wage workers in particular would be more likely to choose a residential location close to their workplace, if one is available."[26] In areas where existing jobs-housing match is closer to optimal, low income housing nevertheless generates less VMT than market-

[21] Pub. Resources Code, § 21155 ("For purposes of this section, a high-quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.").
[22] Including naturally-occurring affordable residential units.
[23] Chapple et al. (2017) *Developing a New Methodology for Analyzing Potential Displacement,* Chapter 4, pp. 159-160, available at https://www.arb.ca.gov/research/apr/past/13-310.pdf.
[24] Karner and Benner (2016) *The convergence of social equity and environmental sustainability: Jobs-housing fit and commute distance* ("[P]olicies that advance a more equitable distribution of jobs and housing by linking the affordability of locally available housing with local wage levels are likely to be associated with reduced commuting distances").
[25] Karner and Benner (2015) *Low-wage jobs-housing fit: identifying locations of affordable housing shortages.*
[26] Karner and Benner (2015) *Low-wage jobs-housing fit: identifying locations of affordable housing shortages.*

rate housing.[27,28] Therefore, a project consisting of a high percentage of affordable housing may be a basis for the lead agency to find a less-than-significant impact on VMT. Evidence supports a presumption of less than significant impact for a 100 percent affordable residential development (or the residential component of a mixed-use development) in infill locations. Lead agencies may develop their own presumption of less than significant impact for residential projects (or residential portions of mixed use projects) containing a particular amount of affordable housing, based on local circumstances and evidence. Furthermore, a project which includes any affordable residential units may factor the effect of the affordability on VMT into the assessment of VMT generated by those units.

2. Recommended Numeric Thresholds for Residential, Office, and Retail Projects

Recommended threshold for residential projects: A proposed project exceeding a level of 15 percent below existing VMT per capita may indicate a significant transportation impact. Existing VMT per capita may be measured as regional VMT per capita or as city VMT per capita. Proposed development referencing a threshold based on city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the number of units specified in the SCS for that city, and should be consistent with the SCS.

Residential development that would generate vehicle travel that is 15 or more percent below the existing residential VMT per capita, measured against the region or city, may indicate a less-than-significant transportation impact. In MPO areas, development measured against city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the population or number of units specified in the SCS for that city because greater-than-planned amounts of development in areas above the region-based threshold would undermine the VMT containment needed to achieve regional targets under SB 375.

For residential projects in unincorporated county areas, the local agency can compare a residential project's VMT to (1) the region's VMT per capita, or (2) the aggregate population-weighted VMT per capita of all cities in the region. In MPO areas, development in unincorporated areas measured against aggregate city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the population or number of units specified in the SCS for that city because greater-than-planned amounts of development in areas above the regional threshold would undermine achievement of regional targets under SB 375.

[27] Chapple et al. (2017) *Developing a New Methodology for Analyzing Potential Displacement*, available at https://www.arb.ca.gov/research/apr/past/13-310.pdf.
[28] CAPCOA (2010) *Quantifying Greenhouse Gas Mitigation Measures*, pp. 176-178, available at http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

These thresholds can be applied to either household (i.e., tour-based) VMT or home-based (i.e., trip-based) VMT assessments.[29] It is critical, however, that the agency be consistent in its VMT measurement approach throughout the analysis to maintain an "apples-to-apples" comparison. For example, if the agency uses a home-based VMT for the threshold, it should also be use home-based VMT for calculating project VMT and VMT reduction due to mitigation measures.

Recommended threshold for office projects: A proposed project exceeding a level of 15 percent below existing regional VMT per employee may indicate a significant transportation impact.

Office projects that would generate vehicle travel exceeding 15 percent below existing VMT per employee for the region may indicate a significant transportation impact. In cases where the region is substantially larger than the geography over which most workers would be expected to live, it might be appropriate to refer to a smaller geography, such as the county, that includes the area over which nearly all workers would be expected to live.

Office VMT screening maps can be developed using tour-based data, considering either total employee VMT or employee work tour VMT. Similarly, tour-based analysis of office project VMT could consider either total employee VMT or employee work tour VMT. Where tour-based information is unavailable for threshold determination, project assessment, or assessment of mitigation, home-based work trip VMT should be used throughout all steps of the analysis to maintain an "apples-to-apples" comparison.

Recommended threshold for retail projects: A net increase in total VMT may indicate a significant transportation impact.

Because new retail development typically redistributes shopping trips rather than creating new trips,[30] estimating the total change in VMT (i.e., the difference in total VMT in the area affected with and without the project) is the best way to analyze a retail project's transportation impacts.

By adding retail opportunities into the urban fabric and thereby improving retail destination proximity, local-serving retail development tends to shorten trips and reduce VMT. Thus, lead agencies generally may presume such development creates a less-than-significant transportation impact. Regional-serving retail development, on the other hand, which can lead to substitution of longer trips for shorter ones, may tend to have a significant impact. Where such development decreases VMT, lead agencies should consider the impact to be less-than-significant.

Many cities and counties define local-serving and regional-serving retail in their zoning codes. Lead agencies may refer to those local definitions when available, but should also consider any project-

[29] See Appendix 1 for a description of these approaches.
[30] Lovejoy, et al. (2013) *Measuring the impacts of local land-use policies on vehicle miles of travel: The case of the first big-box store in Davis, California, The Journal of Transport and Land Use*.

specific information, such as market studies or economic impacts analyses that might bear on customers' travel behavior. Because lead agencies will best understand their own communities and the likely travel behaviors of future project users, they are likely in the best position to decide when a project will likely be local-serving. Generally, however, retail development including stores larger than 50,000 square feet might be considered regional-serving, and so lead agencies should undertake an analysis to determine whether the project might increase or decrease VMT.

Mixed-Use Projects

Lead agencies can evaluate each component of a mixed-use project independently and apply the significance threshold for each project type included (e.g., residential and retail). Alternatively, a lead agency may consider only the project's dominant use. In the analysis of each use, a project should take credit for internal capture. Combining different land uses and applying one threshold to those land uses may result in an inaccurate impact assessment.

Other Project Types

Of land use projects, residential, office, and retail projects tend to have the greatest influence on VMT. For that reason, OPR recommends the quantified thresholds described above for purposes of analysis and mitigation. Lead agencies, using more location-specific information, may develop their own more specific thresholds, which may include other land use types. In developing thresholds for other project types, or thresholds different from those recommended here, lead agencies should consider the purposes described in section 21099 of the Public Resources Code and regulations in the CEQA Guidelines on the development of thresholds of significance (e.g., CEQA Guidelines, § 15064.7).

Strategies and projects that decrease local VMT but increase total VMT should be avoided. Agencies should consider whether their actions encourage development in a less travel-efficient location by limiting development in travel-efficient locations.

Redevelopment Projects

Where a project replaces existing VMT-generating land uses, if the replacement leads to a net overall decrease in VMT, the project would lead to a less-than-significant transportation impact. If the project leads to a net overall increase in VMT, then the thresholds described above should apply.

As described above, a project or plan near transit which replaces affordable[31] residential units with a smaller number of moderate- or high-income residential units may increase overall VMT, because

[31] Including naturally-occurring affordable residential units.

displaced residents' VMT may increase.[32] A lead agency should analyze VMT for such a project even if it otherwise would have been presumed less than significant. The assessment should incorporate an estimate of the aggregate VMT increase experienced by displaced residents. That additional VMT should be included in the numerator of the VMT per capita assessed for the project.

If a residential or office project leads to a net increase in VMT, then the project's VMT per capita (residential) or per employee (office) should be compared to thresholds recommended above. Per capita and per employee VMT are efficiency metrics, and, as such, apply only to the existing project without regard to the VMT generated by the previously existing land use.

If the project leads to a net increase in provision of locally-serving retail, transportation impacts from the retail portion of the development should be presumed to be less than significant. If the project consists of regionally-serving retail, and increases overall VMT compared to with existing uses, then the project would lead to a significant transportation impact.

RTP/SCS Consistency (All Land Use Projects)

Section 15125, subdivision (d), of the CEQA Guidelines provides that lead agencies should analyze impacts resulting from inconsistencies with regional plans, including regional transportation plans. For this reason, if a project is inconsistent with the Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS), the lead agency should evaluate whether that inconsistency indicates a significant impact on transportation. For example, a development may be inconsistent with an RTP/SCS if the development is outside the footprint of development or within an area specified as open space as shown in the SCS.

3. Recommendations Regarding Land Use Plans

As with projects, agencies should analyze VMT outcomes of land use plans across the full area over which the plan may substantively affect travel patterns, including beyond the boundary of the plan or jurisdiction's geography. And as with projects, VMT should be counted in full rather than split between origin and destination. (Emissions inventories have sometimes spit cross-boundary trips in order to sum to a regional total, but CEQA requires accounting for the full impact without truncation or discounting). Analysis of specific plans may employ the same thresholds described above for projects. A general plan, area plan, or community plan may have a significant impact on transportation if proposed new residential, office, or retail land uses would in aggregate exceed the respective thresholds recommended above. Where the lead agency tiers from a general plan EIR pursuant to CEQA Guidelines sections 15152 and 15166, the lead agency generally focuses on the environmental impacts that are specific to the later project and were not analyzed as significant impacts in the prior EIR. (Pub. Resources Code, § 21068.5; Guidelines, § 15152, subd. (a).) Thus, in analyzing the later project, the lead agency

[32] Chapple et al. (2017) *Developing a New Methodology for Analyzing Potential Displacement,* Chapter 4, pp. 159-160, available at https://www.arb.ca.gov/research/apr/past/13-310.pdf.

would focus on the VMT impacts that were not adequately addressed in the prior EIR. In the tiered document, the lead agency should continue to apply the thresholds recommended above.

Thresholds for plans in non-MPO areas may be determined on a case-by-case basis.

4. Other Considerations

Rural Projects Outside of MPOs

In rural areas of non-MPO counties (i.e., areas not near established or incorporated cities or towns), fewer options may be available for reducing VMT, and significance thresholds may be best determined on a case-by-case basis. Note, however, that clustered small towns and small town main streets may have substantial VMT benefits compared to isolated rural development, similar to the transit oriented development described above.

Impacts to Transit

Because criteria for determining the significance of transportation impacts must promote "the development of multimodal transportation networks" pursuant to Public Resources Code section 21099, subd. (b)(1), lead agencies should consider project impacts to transit systems and bicycle and pedestrian networks. For example, a project that blocks access to a transit stop or blocks a transit route itself may interfere with transit functions. Lead agencies should consult with transit agencies as early as possible in the development process, particularly for projects that are located within one half mile of transit stops.

When evaluating impacts to multimodal transportation networks, lead agencies generally should not treat the addition of new transit users as an adverse impact. An infill development may add riders to transit systems and the additional boarding and alighting may slow transit vehicles, but it also adds destinations, improving proximity and accessibility. Such development also improves regional vehicle flow by adding less vehicle travel onto the regional network.

Increased demand throughout a region may, however, cause a cumulative impact by requiring new or additional transit infrastructure. Such impacts may be adequately addressed through a fee program that fairly allocates the cost of improvements not just to projects that happen to locate near transit, but rather across a region to all projects that impose burdens on the entire transportation system, since transit can broadly improve the function of the transportation system.

F. Considering the Effects of Transportation Projects on Vehicle Travel

Many transportation projects change travel patterns. A transportation project which leads to additional vehicle travel on the roadway network, commonly referred to as "induced vehicle travel," would need to quantify the amount of additional vehicle travel in order to assess air quality impacts, greenhouse gas emissions impacts, energy impacts, and noise impacts. Transportation projects also are required to

examine induced growth impacts under CEQA. (See generally, Pub. Resources Code, §§ 21065 [defining "project" under CEQA as an activity as causing either a direct or reasonably foreseeable indirect physical change], 21065.3 [defining "project-specific effect" to mean all direct or indirect environmental effects], 21100, subd. (b) [required contents of an EIR].) For any project that increases vehicle travel, explicit assessment and quantitative reporting of the amount of additional vehicle travel should not be omitted from the document; such information may be useful and necessary for a full understanding of a project's environmental impacts. (See Pub. Resources Code, §§ 21000, 21001, 21001.1, 21002, 21002.1 [discussing the policies of CEQA].) A lead agency that uses the VMT metric to assess the transportation impacts of a transportation project may simply report that change in VMT as the impact. When the lead agency uses another metric to analyze the transportation impacts of a roadway project, changes in amount of vehicle travel added to the roadway network should still be analyzed and reported.[33]

While CEQA does not require perfection, it is important to make a reasonably accurate estimate of transportation projects' effects on vehicle travel in order to make reasonably accurate estimates of GHG emissions, air quality emissions, energy impacts, and noise impacts. (See, e.g., *California Clean Energy Com. v. City of Woodland* (2014) 225 Cal.App.4th 173, 210 [EIR failed to consider project's transportation energy impacts]; *Ukiah Citizens for Safety First v. City of Ukiah* (2016) 248 Cal.App.4th 256, 266.) Appendix 2 describes in detail the causes of induced vehicle travel, the robust empirical evidence of induced vehicle travel, and how models and research can be used in conjunction to quantitatively assess induced vehicle travel with reasonable accuracy.

If a project would likely lead to a measurable and substantial increase in vehicle travel, the lead agency should conduct an analysis assessing the amount of vehicle travel the project will induce. Project types that would likely lead to a measurable and substantial increase in vehicle travel generally include:

- Addition of through lanes on existing or new highways, including general purpose lanes, HOV lanes, peak period lanes, auxiliary lanes, or lanes through grade-separated interchanges

Projects that would not likely lead to a substantial or measurable increase in vehicle travel, and therefore generally should not require an induced travel analysis, include:

- Rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets (e.g., highways; roadways; bridges; culverts; Transportation Management System field elements such as cameras, message signs, detection, or signals; tunnels; transit systems; and assets that serve bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity
- Roadside safety devices or hardware installation such as median barriers and guardrails

[33] See, e.g., California Department of Transportation (2006) *Guidance for Preparers of Growth-related, Indirect Impact Analyses*, available at http://www.dot.ca.gov/ser/Growth-related_IndirectImpactAnalysis/GRI_guidance06May_files/gri_guidance.pdf.

- Roadway shoulder enhancements to provide “breakdown space,” dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes
- Addition of an auxiliary lane of less than one mile in length designed to improve roadway safety
- Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left, right, and U-turn pockets, two-way left turn lanes, or emergency breakdown lanes that are not utilized as through lanes
- Addition of roadway capacity on local or collector streets provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit
- Conversion of existing general purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel
- Addition of a new lane that is permanently restricted to use only by transit vehicles
- Reduction in number of through lanes
- Grade separation to separate vehicles from rail, transit, pedestrians or bicycles, or to replace a lane in order to separate preferential vehicles (e.g., HOV, HOT, or trucks) from general vehicles
- Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features
- Installation of traffic metering systems, detection systems, cameras, changeable message signs and other electronics designed to optimize vehicle, bicycle, or pedestrian flow
- Timing of signals to optimize vehicle, bicycle, or pedestrian flow
- Installation of roundabouts or traffic circles
- Installation or reconfiguration of traffic calming devices
- Adoption of or increase in tolls
- Addition of tolled lanes, where tolls are sufficient to mitigate VMT increase
- Initiation of new transit service
- Conversion of streets from one-way to two-way operation with no net increase in number of traffic lanes
- Removal or relocation of off-street or on-street parking spaces
- Adoption or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)
- Addition of traffic wayfinding signage
- Rehabilitation and maintenance projects that do not add motor vehicle capacity
- Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way
- Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve non-motorized travel
- Installation of publicly available alternative fuel/charging infrastructure
- Addition of passing lanes, truck climbing lanes, or truck brake-check lanes in rural areas that do not increase overall vehicle capacity along the corridor

1. Recommended Significance Threshold for Transportation Projects

As noted in Section 15064.3 of the CEQA Guidelines, lead agencies for roadway capacity projects have discretion, consistent with CEQA and planning requirements, to choose which metric to use to evaluate transportation impacts. This section recommends considerations for evaluating impacts using vehicle miles traveled. Lead agencies have discretion to choose a threshold of significance for transportation projects as they do for other types of projects. As explained above, Public Resources Code section 21099, subdivision (b)(1), provides that criteria for determining the significance of transportation impacts must promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses. (*Id.*; see generally, adopted CEQA Guidelines, § 15064.3, subd. (b) [Criteria for Analyzing Transportation Impacts].) With those goals in mind, OPR prepared and the Agency adopted an appropriate transportation metric.

Whether adopting a threshold of significance, or evaluating transportation impacts on a case-by-case basis, a lead agency should ensure that the analysis addresses:

- Direct, indirect and cumulative effects of the transportation project (CEQA Guidelines, § 15064, subds. (d), (h))
- Near-term and long-term effects of the transportation project (CEQA Guidelines, §§ 15063, subd. (a)(1), 15126.2, subd. (a))
- The transportation project's consistency with state greenhouse gas reduction goals (Pub. Resources Code, § 21099)[34]
- The impact of the transportation project on the development of multimodal transportation networks (Pub. Resources Code, § 21099)
- The impact of the transportation project on the development of a diversity of land uses (Pub. Resources Code, § 21099)

The CARB Scoping Plan and the CARB Mobile Source Strategy delineate VMT levels required to achieve legally mandated GHG emissions reduction targets. A lead agency should develop a project-level threshold based on those VMT levels, and may apply the following approach:

1. Propose a fair-share allocation of those budgets to their jurisdiction (e.g., by population);

[34] The California Air Resources Board has ascertained the limits of VMT growth compatible with California containing greenhouse gas emissions to levels research shows would allow for climate stabilization. (See *The 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Target* (p. 78, p. 101); *Mobile Source Strategy* (p. 37).) CARB's *Updated Final Staff Report on Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets* illustrates that the current Regional Transportation Plans and Sustainable Communities Strategies will fall short of achieving the necessary on-road transportation-related GHG emissions reductions called for in the 2017 Scoping Plan (Figure 3, p. 35). Accordingly, OPR recommends not basing GHG emissions or transportation impact analysis for a transportation project solely on consistency with an RTP/SCS.

2. Determine the amount of VMT growth likely to result from background population growth, and subtract that from their "budget";
3. Allocate their jurisdiction's share between their various VMT-increasing transportation projects, using whatever criteria the lead agency prefers.

2. Estimating VMT Impacts from Transportation Projects

CEQA requires analysis of a project's potential growth-inducing impacts. (Pub. Resources Code, § 21100, subd. (b)(5); CEQA Guidelines, § 15126.2, subd. (d).) Many agencies are familiar with the analysis of growth inducing impacts associated with water, sewer, and other infrastructure. This technical advisory addresses growth that may be expected from roadway expansion projects.

Because a roadway expansion project can induce substantial VMT, incorporating quantitative estimates of induced VMT is critical to calculating both transportation and other impacts of these projects. Induced travel also has the potential to reduce or eliminate congestion relief benefits. An accurate estimate of induced travel is needed to accurately weigh costs and benefits of a highway capacity expansion project.

The effect of a transportation project on vehicle travel should be estimated using the "change in total VMT" method described in *Appendix 1*. This means that an assessment of total VMT without the project and an assessment with the project should be made; the difference between the two is the amount of VMT attributable to the project. The assessment should cover the full area in which driving patterns are expected to change. As with other types of projects, the VMT estimation should not be truncated at a modeling or jurisdictional boundary for convenience of analysis when travel behavior is substantially affected beyond that boundary.

Transit and Active Transportation Projects

Transit and active transportation projects generally reduce VMT and therefore are presumed to cause a less-than-significant impact on transportation. This presumption may apply to all passenger rail projects, bus and bus rapid transit projects, and bicycle and pedestrian infrastructure projects. Streamlining transit and active transportation projects aligns with each of the three statutory goals contained in SB 743 by reducing GHG emissions, increasing multimodal transportation networks, and facilitating mixed use development.

Roadway Projects

Reducing roadway capacity (for example, by removing or repurposing motor vehicle travel lanes) will generally reduce VMT and therefore is presumed to cause a less-than-significant impact on transportation. Generally, no transportation analysis is needed for such projects.

Building new roadways, adding roadway capacity in congested areas, or adding roadway capacity to areas where congestion is expected in the future, typically induces additional vehicle travel. For the types of projects previously indicated as likely to lead to additional vehicle travel, an estimate should be made of the change in vehicle travel resulting from the project.

For projects that increase roadway capacity, lead agencies can evaluate induced travel quantitatively by applying the results of existing studies that examine the magnitude of the increase of VMT resulting from a given increase in lane miles. These studies estimate the percent change in VMT for every percent change in miles to the roadway system (i.e., "elasticity").[35] Given that lead agencies have discretion in choosing their methodology, and the studies on induced travel reveal a range of elasticities, lead agencies may appropriately apply professional judgment in studying the transportation effects of a particular project. The most recent major study, estimates an elasticity of 1.0, meaning that every percent change in lane miles results in a one percent increase in VMT.[36]

To estimate VMT impacts from roadway expansion projects:

1. Determine the total lane-miles over an area that fully captures travel behavior changes resulting from the project (generally the region, but for projects affecting interregional travel look at all affected regions).
2. Determine the percent change in total lane miles that will result from the project.
3. Determine the total existing VMT over that same area.
4. Multiply the percent increase in lane miles by the existing VMT, and then multiply that by the elasticity from the induced travel literature:

[% increase in lane miles] x [existing VMT] x [elasticity] = [VMT resulting from the project]

A National Center for Sustainable Transportation tool can be used to apply this method: https://ncst.ucdavis.edu/research/tools

This method would not be suitable for rural (non-MPO) locations in the state which are neither congested nor projected to become congested. It also may not be suitable for a new road that provides new connectivity across a barrier (e.g., a bridge across a river) if it would be expected to substantially

[35] See U.C. Davis, Institute for Transportation Studies (Oct. 2015) *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*; Boarnet and Handy (Sept. 2014) *Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions*, California Air Resources Board Policy Brief, available at https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf.
[36] See Duranton and Turner (2011) *The Fundamental Law of Road Congestion: Evidence from US cities*, available at http://www.nber.org/papers/w15376.

shorten existing trips. If it is likely to be substantial, the trips-shortening effect should be examined explicitly.

The effects of roadway capacity on vehicle travel can also be applied at a programmatic level. For example, in a regional planning process the lead agency can use that program-level analysis to streamline later project-level analysis. (See CEQA Guidelines, § 15168.) A program-level analysis of VMT should include effects of the program on land use patterns, and the VMT that results from those land use effects. In order for a program-level document to adequately analyze potential induced demand from a project or program of roadway capacity expansion, lead agencies cannot assume a fixed land use pattern (i.e., a land use pattern that does not vary in response to the provision of roadway capacity). A proper analysis should account for land use investment and development pattern changes that react in a reasonable manner to changes in accessibility created by transportation infrastructure investments (whether at the project or program level).

Mitigation and Alternatives

Induced VMT has the potential to reduce or eliminate congestion relief benefits, increase VMT, and increase other environmental impacts that result from vehicle travel.[37] If those effects are significant, the lead agency will need to consider mitigation or alternatives. In the context of increased travel that is induced by capacity increases, appropriate mitigation and alternatives that a lead agency might consider include the following:

- Tolling new lanes to encourage carpools and fund transit improvements
- Converting existing general purpose lanes to HOV or HOT lanes
- Implementing or funding off-site travel demand management
- Implementing Intelligent Transportation Systems (ITS) strategies to improve passenger throughput on existing lanes

Tolling and other management strategies can have the additional benefit of preventing congestion and maintaining free-flow conditions, conferring substantial benefits to road users as discussed above.

G. Analyzing Other Impacts Related to Transportation

While requiring a change in the methodology of assessing transportation impacts, Public Resources Code section 21099 notes that this change "does not relieve a public agency of the requirement to analyze a project's potentially significant transportation impacts related to air quality, noise, safety, or any other impact associated with transportation." OPR expects that lead agencies will continue to

[37] See National Center for Sustainable Transportation (Oct. 2015) *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*, available at http://www.dot.ca.gov/newtech/researchreports/reports/2015/10-12-2015-NCST_Brief_InducedTravel_CS6_v3.pdf; see Duranton and Turner (2011) *The Fundamental Law of Road Congestion: Evidence from US cities*, available at http://www.nber.org/papers/w15376.

address mobile source emissions in the air quality and noise sections of an environmental document and the corresponding studies that support the analysis in those sections. Lead agencies should continue to address environmental impacts of a proposed project pursuant to CEQA's requirements, using a format that is appropriate for their particular project.

Because safety concerns result from many different factors, they are best addressed at a programmatic level (i.e., in a general plan or regional transportation plan) in cooperation with local governments, metropolitan planning organizations, and, where the state highway system is involved, the California Department of Transportation. In most cases, such an analysis would not be appropriate on a project-by-project basis. Increases in traffic volumes at a particular location resulting from a project typically cannot be estimated with sufficient accuracy or precision to provide useful information for an analysis of safety concerns. Moreover, an array of factors affect travel demand (e.g., strength of the local economy, price of gasoline), causing substantial additional uncertainty. Appendix B of OPR's General Plan Guidelines summarizes research which could be used to guide a programmatic analysis under CEQA. Lead agencies should note that automobile congestion or delay does not constitute a significant environmental impact (Pub. Resources Code, §21099(b)(2)), and safety should not be used as a proxy for road capacity.

H. VMT Mitigation and Alternatives

When a lead agency identifies a significant impact, it must identify feasible mitigation measures that could avoid or substantially reduce that impact. (Pub. Resources Code, § 21002.1, subd. (a).) Additionally, CEQA requires that an environmental impact report identify feasible alternatives that could avoid or substantially reduce a project's significant environmental impacts.

Indeed, the California Court of Appeal recently held that a long-term regional transportation plan was deficient for failing to discuss an alternative which could significantly reduce total vehicle miles traveled. In *Cleveland National Forest Foundation v. San Diego Association of Governments, et al.* (2017) 17 Cal.App.5th 413, the court found that omission "inexplicable" given the lead agency's "acknowledgment in its Climate Action Strategy that the state's efforts to reduce greenhouse gas emissions from on-road transportation will not succeed if the amount of driving, or vehicle miles traveled, is not significantly reduced." (*Cleveland National Forest Foundation*, *supra*, 17 Cal.App.5th at p. 436.) Additionally, the court noted that the project alternatives focused primarily on congestion relief even though "the [regional] transportation plan is a long-term and congestion relief is not necessarily an effective long-term strategy." (*Id.* at p. 437.) The court concluded its discussion of the alternatives analysis by stating: "Given the acknowledged long-term drawbacks of congestion relief alternatives, there is not substantial evidence to support the EIR's exclusion of an alternative focused primarily on significantly reducing vehicle trips." (*Ibid*.)

Several examples of potential mitigation measures and alternatives to reduce VMT are described below. However, the selection of particular mitigation measures and alternatives are left to the discretion of

the lead agency, and mitigation measures may vary, depending on the proposed project and significant impacts, if any. Further, OPR expects that agencies will continue to innovate and find new ways to reduce vehicular travel.

Potential measures to reduce vehicle miles traveled include, but are not limited to:

- Improve or increase access to transit.
- Increase access to common goods and services, such as groceries, schools, and daycare.
- Incorporate affordable housing into the project.
- Incorporate neighborhood electric vehicle network.
- Orient the project toward transit, bicycle and pedestrian facilities.
- Improve pedestrian or bicycle networks, or transit service.
- Provide traffic calming.
- Provide bicycle parking.
- Limit or eliminate parking supply.
- Unbundle parking costs.
- Provide parking cash-out programs.
- Implement roadway pricing.
- Implement or provide access to a commute reduction program.
- Provide car-sharing, bike sharing, and ride-sharing programs.
- Provide transit passes.
- Shifting single occupancy vehicle trips to carpooling or vanpooling, for example providing ride-matching services.
- Providing telework options.
- Providing incentives or subsidies that increase the use of modes other than single-occupancy vehicle.
- Providing on-site amenities at places of work, such as priority parking for carpools and vanpools, secure bike parking, and showers and locker rooms.
- Providing employee transportation coordinators at employment sites.
- Providing a guaranteed ride home service to users of non-auto modes.

Notably, because VMT is largely a regional impact, regional VMT-reduction programs may be an appropriate form of mitigation. In lieu fees have been found to be valid mitigation where there is both a commitment to pay fees and evidence that mitigation will actually occur. (*Save Our Peninsula Committee v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 140-141; *Gentry v. City of Murrieta* (1995) 36 Cal.App.4th 1359; *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 727–728.) Fee programs are particularly useful to address cumulative impacts. (CEQA Guidelines, § 15130, subd. (a)(3) [a "project's incremental contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact"].) The mitigation program must undergo CEQA evaluation, either on the program as a whole, or the in-lieu fees or other mitigation must be evaluated

on a project-specific basis. (*California Native Plant Society v. County of El Dorado* (2009) 170 Cal.App.4th 1026.) That CEQA evaluation could be part of a larger program, such as a regional transportation plan, analyzed in a Program EIR. (CEQA Guidelines, § 15168.)

Examples of project alternatives that may reduce vehicle miles traveled include, but are not limited to:

- Locate the project in an area of the region that already exhibits low VMT.
- Locate the project near transit.
- Increase project density.
- Increase the mix of uses within the project or within the project's surroundings.
- Increase connectivity and/or intersection density on the project site.
- Deploy management strategies (e.g., pricing, vehicle occupancy requirements) on roadways or roadway lanes.

Appendix 1. Considerations About Which VMT to Count

Consistent with the obligation to make a good faith effort to disclose the environmental consequences of a project, lead agencies have discretion to choose the most appropriate methodology to evaluate project impacts.[38] A lead agency can evaluate a project's effect on VMT in numerous ways. The purpose of this document is to provide technical considerations in determining which methodology may be most useful for various project types.

Background on Estimating Vehicle Miles Traveled

Before discussing specific methodological recommendations, this section provides a brief overview of modeling and counting VMT, including some key terminology.

Here is an illustrative example of some methods of estimating vehicle miles traveled. Consider the following hypothetical travel day (all by automobile):

1. Residence to Coffee Shop
2. Coffee Shop to Work
3. Work to Sandwich Shop
4. Sandwich Shop to Work
5. Work to Residence
6. Residence to Store
7. Store to Residence

Trip-based assessment of a project's effect on travel behavior counts VMT from individual trips to and from the project. It is the most basic, and traditionally the most common, method of counting VMT. A trip-based VMT assessment of the residence in the above example would consider segments 1, 5, 6 and 7. For residential projects, the sum of home-based trips is called *home-based* VMT.

A *tour-based* assessment counts the entire home-back-to-home tour that includes the project. A tour-based VMT assessment of the residence in the above example would consider segments 1, 2, 3, 4, and 5 in one tour, and 6 and 7 in a second tour. A tour-based assessment of the workplace would include segments 1, 2, 3, 4, and 5. Together, all tours comprise *household* VMT.

[38] The California Supreme Court has explained that when an agency has prepared an environmental impact report:

> [T]he issue is not whether the [lead agency's] studies are irrefutable or whether they could have been better. The relevant issue is only whether the studies are sufficiently credible to be considered as part of the total evidence that supports the [lead agency's] finding[.]

(*Laurel Heights Improvement Assn. v. Regents of the University of California* (1988) 47 Cal.3d 376, 409; see also *Eureka Citizens for Responsible Gov't v. City of Eureka* (2007) 147 Cal.App.4th 357, 372.)

Both trip- and tour-based assessments can be used as measures of transportation efficiency, using denominators such as per capita, per employee, or per person-trip.

Trip- and Tour-based Assessment of VMT

As illustrated above, a tour-based assessment of VMT is a more complete characterization of a project's effect on VMT. In many cases, a project affects travel behavior beyond the first destination. The location and characteristics of the home and workplace will often be the main drivers of VMT. For example, a residential or office development located near high quality transit will likely lead to some commute trips utilizing transit, affecting mode choice on the rest of the tour.

Characteristics of an office project can also affect an employee's VMT beyond the work tour. For example, a workplace located at the urban periphery, far from transit, can require an employee to own a car, which in turn affects the entirety of an employee's travel behavior and VMT. For this reason, when estimating the effect of an office development on VMT, it may be appropriate to consider total employee VMT if data and tools, such as tour-based models, are available. This is consistent with CEQA's requirement to evaluate both direct and *indirect* effects of a project. (See CEQA Guidelines, § 15064, subd. (d)(2).)

Assessing Change in Total VMT

A third method, estimating the *change in total VMT* with and without the project, can evaluate whether a project is likely to divert existing trips, and what the effect of those diversions will be on total VMT. This method answers the question, "What is the net effect of the project on area VMT?" As an illustration, assessing the total change in VMT for a grocery store built in a food desert that diverts trips from more distant stores could reveal a net VMT reduction. The analysis should address the full area over which the project affects travel behavior, even if the effect on travel behavior crosses political boundaries.

Using Models to Estimate VMT

Travel demand models, sketch models, spreadsheet models, research, and data can all be used to calculate and estimate VMT (see Appendix F of the preliminary discussion draft). To the extent possible, lead agencies should choose models that have sensitivity to features of the project that affect VMT. Those tools and resources can also assist in establishing thresholds of significance and estimating VMT reduction attributable to mitigation measures and project alternatives. When using models and tools for those various purposes, agencies should use comparable data and methods, in order to set up an "apples-to-apples" comparison between thresholds, VMT estimates, and VMT mitigation estimates.

Models can work together. For example, agencies can use travel demand models or survey data to estimate existing trip lengths and input those into sketch models such as CalEEMod to achieve more

accurate results. Whenever possible, agencies should input localized trip lengths into a sketch model to tailor the analysis to the project location. However, in doing so, agencies should be careful to avoid double counting if the sketch model includes other inputs or toggles that are proxies for trip length (e.g., distance to city center). Generally, if an agency changes any sketch model defaults, it should record and report those changes for transparency of analysis. Again, trip length data should come from the same source as data used to calculate thresholds to be sure of an "apples-to-apples" comparison.

Additional background information regarding travel demand models is available in the California Transportation Commission's "2010 Regional Transportation Plan Guidelines," beginning at page 35.

Appendix 2. Induced Travel: Mechanisms, Research, and Additional Assessment Approaches

Induced travel occurs where roadway capacity is expanded in an area of present or projected future congestion. The effect typically manifests over several years. Lower travel times make the modified facility more attractive to travelers, resulting in the following trip-making changes:

- **Longer trips.** The ability to travel a long distance in a shorter time increases the attractiveness of destinations that are farther away, increasing trip length and vehicle travel.
- **Changes in mode choice.** When transportation investments are devoted to reducing automobile travel time, travelers tend to shift toward automobile use from other modes, which increases vehicle travel.
- **Route changes.** Faster travel times on a route attract more drivers to that route from other routes, which can increase or decrease vehicle travel depending on whether it shortens or lengthens trips.
- **Newly generated trips.** Increasing travel speeds can induce additional trips, which increases vehicle travel. For example, an individual who previously telecommuted or purchased goods on the internet might choose to accomplish those tasks via automobile trips as a result of increased speeds.
- **Land Use Changes.** Faster travel times along a corridor lead to land development farther along that corridor; that new development generates and attracts longer trips, which increases vehicle travel. Over several years, this induced growth component of induced vehicle travel can be substantial, making it critical to include in analyses.

Each of these effects has implications for the total amount of vehicle travel. These effects operate over different time scales. For example, changes in mode choice might occur immediately, while land use changes typically take a few years or longer. CEQA requires lead agencies to analyze both short-term and long-term effects.

Evidence of Induced Vehicle Travel. A large number of peer reviewed studies[39] have demonstrated a causal link between highway capacity increases and VMT increases. Many provide quantitative estimates of the magnitude of the induced VMT phenomenon. Collectively, they provide high quality evidence of the existence and magnitude of the induced travel effect.

[39] See, e.g., Boarnet and Handy (Sept. 2014) Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions, California Air Resources Board Policy Brief, available at https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf; National Center for Sustainable Transportation (Oct. 2015) *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*, available at http://www.dot.ca.gov/research/researchreports/reports/2015/10-12-2015-NCST_Brief_InducedTravel_CS6_v3.pdf.

Most of these studies express the amount of induced vehicle travel as an "elasticity," which is a multiplier that describes the additional vehicle travel resulting from an additional lane mile of roadway capacity added. For example, an elasticity of 0.6 would signify an 0.6 percent increase in vehicle travel for every 1.0 percent increase in lane miles. Many of these studies distinguish "short run elasticity" (increase in vehicle travel in the first few years) from "long run elasticity" (increase in vehicle travel beyond the first few years). Long run elasticity is larger than short run elasticity, because as time passes, more of the components of induced vehicle travel materialize. Generally, short run elasticity can be thought of as excluding the effects of land use change, while long run elasticity includes them. Most studies find a long run elasticity between 0.6 and just over 1.0,[40] meaning that every increase in lanes miles of one percent leads to an increase in vehicle travel of 0.6 to 1.0 percent. The most recent major study finds the elasticity of vehicle travel by lanes miles added to be 1.03; in other words, each percent increase in lane miles results in a 1.03 percent increase in vehicle travel.[41] (An elasticity greater than 1.0 can occur because new lanes induce vehicle travel that spills beyond the project location.) In CEQA analysis, the long-run elasticity should be used, as it captures the full effect of the project rather than just the early-stage effect.

Quantifying Induced Vehicle Travel Using Models. Lead agencies can generally achieve the most accurate assessment of induced vehicle travel resulting from roadway capacity increasing projects by applying elasticities from the academic literature, because those estimates include vehicle travel resulting from induced land use. If a lead agency chooses to use a travel demand model, additional analysis would be needed to account for induced land use. This section describes some approaches to undertaking that additional analysis.

Proper use of a travel demand model can capture the following components of induced VMT:

- Trip length (generally increases VMT)
- Mode shift (generally shifts from other modes toward automobile use, increasing VMT)
- Route changes (can act to increase or decrease VMT)
- Newly generated trips (generally increases VMT)
    - Note that not all travel demand models have sensitivity to this factor, so an off-model estimate may be necessary if this effect could be substantial.

However, estimating long-run induced VMT also requires an estimate of the project's effects on land use. This component of the analysis is important because it has the potential to be a large component of

[40] See Boarnet and Handy (Sept. 2014) *Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions*, California Air Resources Board Policy Brief, p. 2, available at https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf.

[41] Duranton and Turner (2011) *The Fundamental Law of Road Congestion: Evidence from US cities*, available at http://www.nber.org/papers/w15376.

the overall induced travel effect. Options for estimating and incorporating the VMT effects that are caused by the subsequent land use changes include:

1. *Employ an expert panel.* An expert panel could assess changes to land use development that would likely result from the project. This assessment could then be analyzed by the travel demand model to assess effects on vehicle travel. Induced vehicle travel assessed via this approach should be verified using elasticities found in the academic literature.
2. *Adjust model results to align with the empirical research.* If the travel demand model analysis is performed without incorporating projected land use changes resulting from the project, the assessed vehicle travel should be adjusted upward to account for those land use changes. The assessed VMT after adjustment should fall within the range found in the academic literature.
3. *Employ a land use model, running it iteratively with a travel demand model.* A land use model can be used to estimate the land use effects of a roadway capacity increase, and the traffic patterns that result from the land use change can then be fed back into the travel demand model. The land use model and travel demand model can be iterated to produce an accurate result.

A project which provides new connectivity across a barrier, such as a new bridge across a river, may provide a shortened path between existing origins and destinations, thereby shortening existing trips. In rare cases, this trip-shortening effect might be substantial enough to reduce the amount of vehicle travel resulting from the project below the range found in the elasticities in the academic literature, or even lead a net reduction in vehicle travel overall. In such cases, the trip-shortening effect could be examined explicitly.

Whenever employing a travel demand model to assess induced vehicle travel, any limitation or known lack of sensitivity in the analysis that might cause substantial errors in the VMT estimate (for example, model insensitivity to one of the components of induced VMT described above) should be disclosed and characterized, and a description should be provided on how it could influence the analysis results. A discussion of the potential error or bias should be carried into analyses that rely on the VMT analysis, such as greenhouse gas emissions, air quality, energy, and noise.

APPENDIX B

PROPOSED MITIGATION STRATEGIES FOR IMPLEMENTATION OF SB 743

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Proposed Mitigation Strategies for Implementation of SB 743

Categories	Mitigation Strategies	Proposed Language
Tier 1 - **On-Site Improvements**	**1.** Pedestrian Network Improvements **2.** Incorporate Bike Lane Street Design **3.** Provide Traffic Calming Measures **4.** Increase density **5.** Provide enhanced bicycle and/or pedestrian facilities **6.** Mixed-Use Overlay **7.** Incorporate affordable housing **8.** Bike parking for non-residential projects or multi-unit residential projects	**1.** Pedestrian Network Improvements shall be incorporated into a project site plan that provide pedestrian walkway access from a building entrance/exit to other buildings on the project site and a sidewalk that leads off-site.[1] **2.** Projects that include dedicated rights-of-way, non-dedicated roadways, or both, shall be designed at an appropriate width to accommodate, at a minimum, a painted on-street Bike Lane. [2] **3.** Traffic Calming Measures (TCMs) shall be incorporated into a project site plan, where applicable. [3] **4.** A density bonus will be allowed in conformance with Orange County Zoning Code. [4] **5.** Projects with existing bicycle and pedestrian facilities shall double the capacity of bicycle facilities (e.g., bicycle racks) and shall expand pedestrian walkway access such that all onsite buildings are interconnected and off-street connectivity is provided. **6.** A density bonus shall be allowed if a project includes both residential and employment land uses. **7**. A density bonus shall be allowed if a project includes affordable housing per the Zoning Code. 8. Bicycle parking shall be provided in a secure, enclosed location and be identified on a site plan. The bike parking shall be provided based on duration for non-residential developments. [5]

Proposed Mitigation Strategies for Implementation of SB 743

Categories	Mitigation Strategies	Proposed Language
Tier 2 - **Financial Incentives**	**9.** Project contributions to infrastructure improvement projects **10.** School pool program **11.** Subsidize vanpool for housing developments **12.** Provide car-sharing, bike-sharing or ride-sharing programs **13.** Provide subsidized transit passes	9. Should a program be adopted in the future, this will be an option for Applicants. [6] **10**. Each residential project would provide new homebuyers with a flyer describing the time and cost savings of carpooling. [7] **11**. Each residential project would provide new homebuyers or resale homebuyers with vouchers for each applicable commercial vanpool service for the period of time they own the home. [8] **12**. Each residential project would provide new homebuyers or resale homebuyers with flyers detailing the car-sharing, bike-sharing, or ride-sharing programs, documenting the time and cost savings of each. Non-residential projects would provide each employee with this flyer and post the flyer in a lunch room or break room location. [8] **13**. Each residential project would provide new homebuyers or resale homebuyers with transit subsidies for the period of time they own the home. Non-residential projects would provide each employee with access to transit subsidies. [8]

Notes:

1. The Pedestrian Network Improvements should provide intra-project connectivity and connectivity off-site.

2. A Class II bike lane represents a minimum standard. Class I off-street bike paths or Class IV bike boulevards could also be included and may result in greater usage and a greater reduction in VMTs.

3. TCMs are going to vary significantly among project types (residential v. commercial, etc.) and the size of the project envelope, and the types of TCMs that could be included. Project applicants should ensure measures are appropriate for the proposed project.

4. The density bonus in the Zoning Code applies to residential. However, appropriate measures may be applied to a non-residential project at the discretion of the County where VMT reduction may result.

5. In accordance with the 2019 California Green Building Standards Code for non-residential developments, short-term bicycle parking will require 5% of motorized vehicle parking spaces with a minimum of one two-bike rack. Long-term bicycle parking will require 5% of tenant-occupant vehicular parking spaces with a minimum of one bike parking facility.

6. The particular type of infrastructure project should be determined, as some would be more applicable than others. Also, the fee increment would have to be calculated.

7. Actual metrics on how much time and money would be saved should be provided that are specific to the project area.

8. Coordination would be the responsibility of the project applicant.

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Attachment 8

RESOLUTION OF THE BOARD OF SUPERVISORS OF ORANGE COUNTY, CALIFORNIA TO REQUEST THE DELAY OF THE IMPLEMENTATION OF TITLE 14 OF THE CALIFORNIA CODE OF REGULATIONS, SECTION 15064.3

June 23, 2020

WHEREAS, on January 30, 2020, the World Health Organization (WHO) declared COVID-19 a Public Health Emergency of International Concern, and on January 31, 2020, the United States Secretary of Health and Human Services declared a Public Health Emergency; and

WHEREAS, On March 4, 2020, California Governor Gavin Newsom declared a State of Emergency to make additional resources available, formalize emergency actions already underway across multiple state agencies and departments, and help the state prepare for a broader spread of COVID-19; and

WHEREAS, the County of Orange is experiencing a decline in revenues, unanticipated COVID-19 expenses have been incurred including expenses related to disinfection of public facilities, purchase of personal protective equipment, new technology for remote operations, increased public safety costs (including overtime), increased personnel costs (including overtime), purchasing supplies for residents and financial support to residents and businesses; and

WHEREAS, the County of Orange, is required by a new state regulation (Title 14 of the California Code of Regulations, section 15064.3) to adopt a threshold of significance under the California Environmental Quality Act (CEQA) making the act of driving one mile by a car or pickup truck (even an electric car) by all future resident, visitor, vendor or employee to the new housing, commercial or other projects an environmental "impact" under CEQA; and

WHEREAS, state VMT regulations allow cities and counties to establish a "threshold of significance" for determining how much VMT is a "significant" CEQA impact that requires projects to pay for VMT mitigation, and different state agencies have conflicting recommendations for when and whether a VMT impact is "significant" under CEQA; and

WHEREAS, CEQA mitigation for VMT under CEQA must result in reductions of VMT to reduce project VMT to levels that are less than "significant," but car travel remains a necessity for the overwhelming majority of Orange County residents and employees who do not use public transit, or bike or walk to work, and instead rely on a car to complete essential tasks including getting to work, acquiring necessary goods such as foods, and obtaining medical care; and

WHEREAS, the COVID-19 pandemic is resulting in dramatic changes in transportation patterns such as the expansion of working from home, learning from home, and even receiving medical care from home via remote communication technologies, as well as 90% decreases in public transit ridership based on social distancing and related health priorities;

WHEREAS, the state agency adopting the VMT Guidelines strongly recommends imposition of a regional "VMT Fee" (e.g., to fund bus passes or bike sharing services) on new projects to "mitigate" VMT impacts; and

WHEREAS, notwithstanding the fact that this state agency has proposed this VMT CEQA expansion for more than six years, no such VMT Fee mitigation program exists, and funding for the establishment of a regional VMT program has been proposed but not approved and no work on a VMT mitigation fee program has been completed by the Southern California Association of Governments for the region; and

WHEREAS, other state agency recommended VMT fee programs such as direct purchase of LA Metro bus passes would add from $40,000 to over $400,000 to the price of a home in San Bernardino County (depending on which conflicting state-recommended VMT significance standard is adopted), and would also add substantial new VMT CEQA mitigation costs to projects that would create jobs and other economic revenues; and

WHEREAS, a civil rights lawsuit challenging the expansion of CEQA to impose massive new VMT mitigation costs of housing remains pending in San Bernardino County but has been delayed by the COVID-19 emergency; and

WHEREAS, conflicting significant significance threshold recommendations from state agencies, and the absence of any feasible existing VMT Fee mitigation program, creates significant legal uncertainties about how the county will be required to implement CEQA as of July 1; and

WHEREAS, the majority of CEQA lawsuits target housing projects, and the most frequently targeted commercial projects are in the logistics industry; and

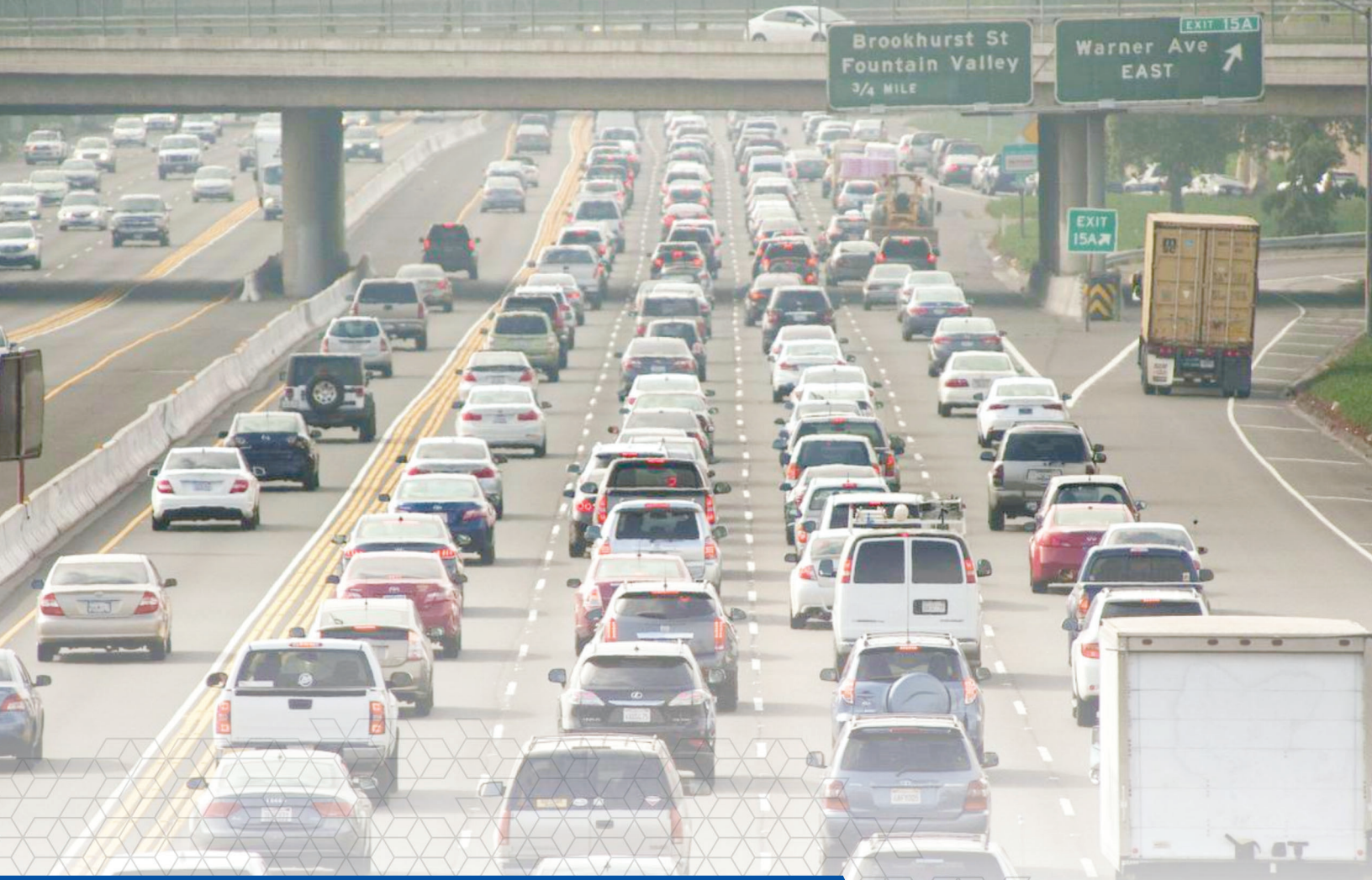
WHEREAS, defending CEQA lawsuits consumes County time and resources, and the County is responding to urgent COVID-19 emergencies including the ongoing housing crisis, and the new unemployment crisis and loss of household income as well as tax revenues and fees.

NOW THEREFORE, BE IT RESOLVED that, the County of Orange hereby requests that Governor Newsom extend the implementation date of Title 14 of the California Code of Regulations, section 15064.3 until at least July 1, 2021.

Be it further resolved that the action taken today be transmitted to Governor Newsom immediately.

Be it further resolved that staff report back to the County within 120 days, and annually thereafter, about proposed or available VMT Mitigation fee program, and until then and for the duration of the COVID-19 emergency and until further consideration and action, avoid imposing VMT mitigation under CEQA based on the health and safety urgency of continuing to allow residents, employees, vendors and guests to use their private automobiles without increasing the cost of new housing, employment, school, recreation or other projects.

Attachment 2



LSA

FINAL DRAFT

GUIDELINES FOR EVALUATING VEHICLE MILES TRAVELED UNDER CEQA

for the

COUNTY OF ORANGE

SEPTEMBER 11, 2020

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FINAL DRAFT

GUIDELINES FOR EVALUATING VEHICLE MILES TRAVELED UNDER CEQA

COUNTY OF ORANGE

Submitted to:

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Project No. OCY1701.19

September 2020

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LIST OF ABBREVIATIONS AND ACRONYMS

ADT	average daily trips
CalEEMod	California Emissions Estimator Model
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CO_2e	carbon dioxide equivalent
County	County of Orange
EO	Executive Order
FAR	floor-to-area ratio
Guidelines	2020 *State CEQA Guidelines*, 14 California Code of Regulations, Section 15000, et. seq.
GWP	global warming potential
HOT	high-occupancy toll
HOV	high-occupancy vehicle
HQTA	High-Quality Transit Area
LOS	level of service
LRTP	Long-Range Transportation Plan
mi	mile
MT	metric ton
MPO	Metropolitan Planning Organizations
OCTAM	Orange County Transportation Analysis Model
OPR	Governor's Office of Planning and Research

PRC	Public Resources Code
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
RTPA	Regional Transportation Planning Agency
SB	Senate Bill
SCAG	Southern California Association of Government
SOC	Statement of Overriding Considerations
TA	Technical Advisory
TDM	transportation demand management
TPA	Transit Priority Area
TSP	Transit Signal Priority
VMT	vehicle miles traveled

1.0 INTRODUCTION

Senate Bill (SB) 743, signed in 2013, changed the way transportation studies are conducted in California Environmental Quality Act (CEQA) documents. Vehicle miles traveled (VMT) replaces motorist delay and level of service (LOS) as the metric for impact determination. For land development projects, VMT is simply the product of the daily trips generated by a new development and the distance those trips travel to their destinations. For capital projects, impacts are identified as the new VMT attributable to the added capital project, both from the installation of the facility and the induced growth.

This document serves as a guide for application and substantial evidence for the County of Orange's (County) adopted project screenings, significance thresholds, and mitigation strategies, modeled after the Governor's Office of Planning and Research's (OPR) Technical Advisory (TA) for CEQA transportation studies; however, as in previous CEQA practice, the applicant/project proponent will still be required to provide traffic analysis that is specific to the proposed project to be reviewed and approved by the County.[1] These guidelines apply to all projects for which the County is the Lead Agency for certification or adoption of CEQA documents. If the County is the Lead Agency, but the project is located in another jurisdiction, these guidelines would apply. However, if the County is not the Lead Agency, and the project is located in another jurisdiction, the Lead Agency would determine which VMT guidelines should be used for analysis.

In January 2019, the Natural Resources Agency and the OPR codified SB 743 into the Public Resources Code (PRC) and the *State CEQA Guidelines*.

The *State CEQA Guidelines*, included in Title 14 of the California Code of Regulations, Section 15064.3 subdivision (b)—hereafter referred to as the Guidelines—states the following criteria for analyzing transportation impacts:

1. **Land Use Projects.** Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.

2. **Transportation Projects.** Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent that such impacts have already been adequately addressed at a programmatic level, such as in a

[1] The County will review Public Resources Code Section 21166 to determine whether VMT analysis is required for the later-prepared environmental documents, including subsequent and supplemental EIRs and addendums. Absent facts or legal requirements to the contrary, the County will not, as a matter of course, require VMT analysis for later-prepared documents. (See, e.g., *CREED v. San Diego* [2011] 196 Cal. App. 4th 515; *Concerned Dublin Citizens v. City of Dublin* [2013] 214 Cal. App. 4th 1301, 1320.)

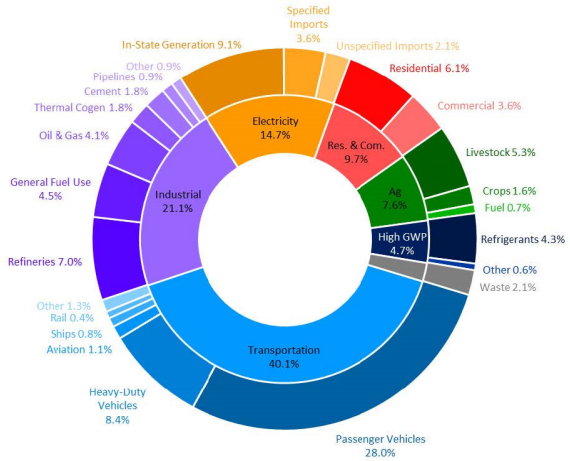
regional transportation plan EIR, a lead agency may tier from that analysis as provided in Section 15152.

3. **Qualitative Analysis.** If existing models or methods are not available to estimate the vehicle miles traveled for the particular project being considered, a lead County may analyze the project's vehicle miles traveled qualitatively. Such a qualitative analysis would evaluate factors such as the availability of transit, proximity to other destinations, etc. For many projects, a qualitative analysis of construction traffic may be appropriate.

4. **Methodology.** A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household, or in any other measure. A lead agency may use models to estimate a project's vehicle miles traveled, and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revisions to model outputs should be documented and explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section.

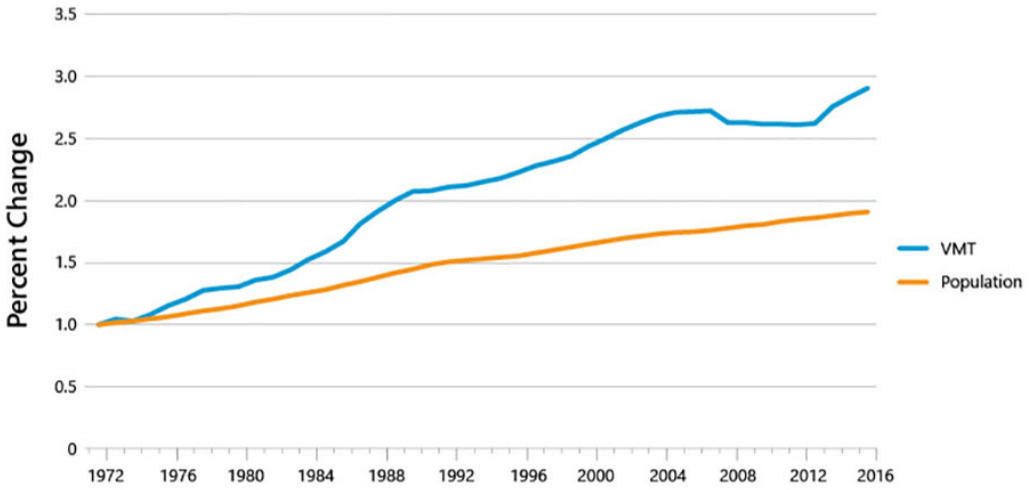
The OPR provides a TA (see Appendix A) as a guidance document to establish thresholds under this new VMT metric. The laws and rules governing the CEQA process are contained in the CEQA statute (PRC Section 21000 and following), the Guidelines (California Code of Regulations, Title 14, Section 15000 and following), published court decisions interpreting CEQA, and locally adopted CEQA procedures. The TA is intended as a reference document; it does not have the weight of law, but is intended by OPR to provide substantial evidence for the thresholds proposed therein. Thus, deviating from the TA is best undertaken with substantial evidence to support the County action.

The State of California has committed to reducing greenhouse gas (GHG) emissions and achieving long-term climate change goals. To achieve these climate change goals, the State has determined that overall VMT needs to be reduced. As Figure 1 shows, transportation is the single largest sector contributing to the State's GHG emissions. More than 40 percent of the GHG emissions come from the transportation sector, primarily passenger cars and light-duty trucks. According to the State, removing these vehicle trips and/or reducing the length of existing trips is expected to result in reduced VMT and reduced GHG emissions. As illustrated in Figure 2, over the last 40 years, VMT has grown faster than population growth. According to the OPR and the State, the new Guidelines and the establishment of VMT thresholds for CEQA analyses are linked to GHG reduction strategies and overall statewide climate change goals.



Source: California Greenhouse Gas Emissions for 2000 to 2017 Trends of Emissions and Other Indicators (California Air Resources Board Report)

Figure 1: 2017 GHG Emissions in California by Scoping Plan Sector and Sub-Sector Category

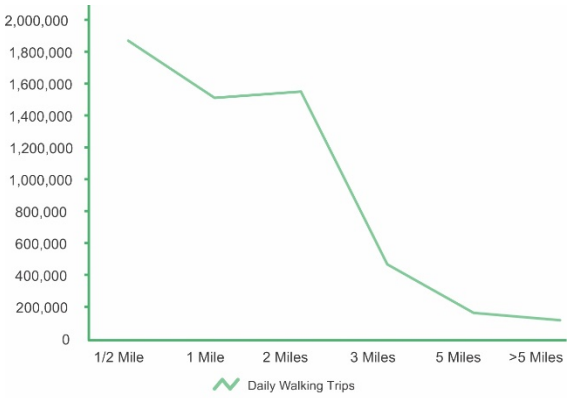


Source: https://ca50million.ca.gov/transportation/

Figure 2: California Statewide Population and VMT Trends

The State and the Southern California Association of Governments (SCAG), the metropolitan planning organization for Southern California, have provided guidance that the number of vehicle trips and the length of vehicle trips can be reduced by locating new development near available transit and a mix of other land uses. This is one example of a strategy to reduce project related VMT. SB 743 is intended to promote infill development, encourage multimodal transportation networks, and reduce GHG emissions.

In one example, SCAG's Draft Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) (SCAG 2019) includes data showing that the number of walking trips greatly diminishes for distances longer than 2 miles (Figure 3). If a person's destination or a transit station are within 2 miles of a person's home, the person may choose a non-vehicle travel mode.



Sources: SCAG Connect Socal: The 2020-2045 RTP/SCS Active Transportation Technical Appendix, Page 30; California Household Travel Survey (2012).

Figure 3: SCAG Region Total Number of Daily Walking Trips by Distance

This document provides a guide for application and substantial evidence for the County's adopted thresholds of significance, modeled after OPR's suggestions, for CEQA transportation studies. It is divided into chapters, including:

- **Chapter 2 – Definition of Region:** Here, the document describes what the comparative region is for analysis purposes. Each project will be compared to an existing regional average. The geographical area that defines the region is defined and described.

- **Chapter 3 – Project Screening:** This chapter provides criteria, and, where applicable, substantial evidence for screening out certain types of projects that, by their nature, or by virtue of other factors, would result in less than significant transportation impacts. This is consistent with the OPR's acknowledgment that certain projects are either low VMT generators, or by virtue of their location would have a less than significant impact.

- **Chapter 4 – Significance Thresholds for Land Development Projects:** In this chapter, the threshold that would define a significant CEQA impact for land use projects is identified. This threshold is linked to a specific travel mode and a set of trip purposes. The actual VMT metric (either an efficiency rate or total VMT) is described.

- **Chapter 5 – Significant Thresholds for Transportation Projects:** This chapter describes the method to evaluate significant CEQA impacts associated with transportation projects. Many non-vehicular capital projects are presumed to have a less than significant impact. Capacity-enhancing projects may have significant impacts and will be subject to a detailed analysis that will include measuring induced travel.

- **Chapter 6 – Significance Thresholds for Land Plans:** This chapter provides guidance and substantial evidence to support the County's treatment of land use plans and their CEQA transportation analysis.

- **Chapter 7 – Mitigation Strategies:** This chapter provides examples of potential mitigation strategies. It is noted that this discussion does not present an exhaustive list of feasible mitigation measures that may be applied to a project. As in previous CEQA practice, the applicant/project proponent will be required to identify mitigation measures to reduce, avoid, or offset the specific project-related impacts identified in an individual environmental document.

2.0 DEFINITION OF REGION: VEHICLE MILES TRAVELED CONTEXT AND DETERMINING THE BASELINE

The question of context defines the scope of the VMT analysis. The common term for this in previous delay-based LOS analyses is ***project study area***. In the delay-based LOS analyses, a project study area is generally determined based on the incremental increase in traffic from the project and its potential to create a significant LOS impact. This generally includes intersections and roadway segments where the project would add a prescribed number of peak-hour trips. Many times, lead agencies stop study area boundaries at their jurisdictional borders.

Based on the evidence and analysis provided below, the "Region" for Orange County is the entire county area.

Region is not defined in the TA. Instead, the OPR offers the following suggestions:

> *In cases where the region is substantially larger than the geography over which most workers would be expected to live, it might be appropriate to refer to a smaller geography, such as **county**, that includes the area over which nearly all workers would be expected to live (page 16).*
>
> 1. *For residential projects in unincorporated county areas, the local County can compare a residential project's VMT to (1) the region's VMT per capita, or (2) the aggregate population weighted VMT per capita of all cities in the region.*

The TA bases recommendations for thresholds for the primary land use types (residential and office) on a comparison to a ***regional average***. The County will utilize the region's VMT per capita approach. The OPR guidance recommends consistency in approach; once a region is established, that region should be used for all subsequent traffic analyses.

Other large or urbanized areas around the State have been surveyed to identify what region has been established for VMT thresholds. In most cases, the county boundary has been identified as the region selected for VMT analysis. In some cases, this county boundary has other names, such as the Council of Governments boundary.

County is a common and reoccurring context for CEQA VMT analyses throughout the State. According to the Orange County Transportation Analysis Model (OCTAM 5.0), of the total trips in and out of Orange County, about 21 percent originate and are destined within the unincorporated county area. Another 67 percent of trips originate or are destined within the municipal jurisdictions (cities) in Orange County. The remaining 12 percent of Orange County trips have a trip end in the other counties of the SCAG region or beyond. Because the majority of the unincorporated county trips are contained within the entirety of Orange County (approximately 88 percent) and many other large urbanized areas are defining their region as their counties, the use of Orange County in its entirety is defined as the region for CEQA land development transportation analyses.

Table A: County of Orange Unincorporated Vehicle Miles Traveled Data (Using OCTAM Base Year 2016)

Table 1 - San Diego Trips

Region	Total Trips	Trips to/from San Diego	Percent San Diego Trips
Unincorporated Orange County	668,689	3,165	0.5%
Total Orange County (including unincorporated Orange)	19,004,260	69,830	0.4%

Table 2 - Percent County of Orange Trips with Orange County as region

Trips within Unincorporated Orange County + Trips between Unincorporated and Incorporated Orange County	525,288
Total Trips within Entire Orange County (Internal - Internal)	8,559,626
Percent County of Orange Trips within Orange County	**6.1%**

Table 3 - Percent County of Orange Trips with Orange County + 10 mile buffer as region

Trips within Unincorporated Orange County + Trips between Unincorporated and Incorporated Orange County, and 10-mile buffer around Orange County (parts of LA, Riverside, and San Bernadino County)	575,922
Total Trips within Entire Orange County + 10-Mile Buffer around Orange County (Internal - Internal)	14,800,711
Percent County of Orange Trips within Orange County + 10-mile Buffer	**3.9%**

Table 3a - Percent County of Orange Trips with Orange County + 10 mile buffer as region

Total Trips to/from Entire Orange County (includes unincorporated Orange County + external trips)	9,451,544
Trips within Entire Modeling area (Orange, LA, Ventura, Riverside, and San Bernadino Counties + External Stations)	48,342,620
Percent Orange County Trips in Entire Modeling Area	**19.6%**

Table 4 - VMT Per Capita

Region	Total Homebased VMT	Total Household Population	VMT/Capita
Unincorporated Orange County	3,477,242	145,121	24.0
Total Orange County (including unincorporated Orange)	56,757,571	3,179,626	17.9
Total Orange County + Part LA, Riverside, and SB Counties (10 miles from county boundary)	116,115,946	6,241,508	18.6

Table 5 - VMT Per Employee

Region	Total Homebased Work VMT	Total Employment	VMT/Employee
Unincorporated Orange County	1,348,364	33,312	40.5
Total Orange County (including unincorporated Orange)	41,174,971	1,710,147	24.1
Total Orange County + Part LA, Riverside, and SB Counties (10 miles from county boundary)	66,768,783	2,766,068	24.1

Source: OCTAM5 Base Year model run (2016)

It should be recognized the use of Orange County as the region defines the comparative (i.e., baseline), or the denominator, in the identification of project-related impact. The numerator is the project's VMT contribution. The project-related/generated VMT profile may go beyond the county boundary and not be truncated by a jurisdictional boundary. For example, a new, large land development proposed near Orange County's eastern boundary may include VMT from as far away as Corona or other communities in Riverside and San Bernardino counties. In that case, it would be the responsibility of the applicant and their traffic study preparer to include the project VMT, regardless of geographical limit, to the satisfaction of the County staff. This project-related VMT profile would be compared against the County regional baseline.

Unlike delay-based LOS analyses, VMT is a regional effect not defined by roadway, intersection, or pathway. The OPR acknowledges this in its TA (page 6), which states,

> *Lead agencies should not truncate any VMT analysis because of jurisdictional or other boundaries by failing to count the portion of a trip that falls outside the jurisdiction or by discounting the VMT from a trip that crosses a jurisdictional boundary.*

Table A is used as the current 2020 calculations to demonstrate what calculations should be applied. Tables 2, 4, and 5, in Table A identify the relevant VMT baselines for the region. These baselines will be revised as the OCTAM is revised beyond version 5.0. Applicants should use the most up-to-date version of the OCTAM in setting the baseline and analyzing their project.[2]

[2] The County strongly recommends that the entire Orange County region be used as the baseline to analyze proposed projects based on the substantial evidence provided herein. However, as CEQA allows, variances to the baseline may be presented for review and approval to the County by project applicants pursuant to CEQA Guidelines Section 15064.3(b)(4). Such alternate baselines must be supported by substantial evidence.

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3.0 PROJECT SCREENING

The TA acknowledges that certain activities and projects may result in a less than significant impact to transportation and circulation. A variety of projects may be screened out of a complicated VMT analysis due to the presumption described in the TA regarding the occurrence of less than significant impacts.

3.1 Land Development Projects

The TA acknowledges that conditions may exist under which a land development project would have a less than significant impact on transportation and circulation. These may be size, location, proximity to transit, or trip-making potential.

Land development projects that have one or more of the following attributes may be presumed to create a less than significant impact on transportation and circulation.

- **Project in High-Quality Transit Area (HQTA):** The project is within 0.5 mile (mi) of a Transit Priority Area (TPA) or an HQTA, unless the project is inconsistent with the RTP/SCS, has a floor-to-area ratio (FAR) less than 0.75, provides an excessive amount of parking, or reduces the number of affordable residential units. In accordance with SB 743, "Transit priority areas" are defined as "an area within one-half mile of a major transit stop that is existing or planned, if the planned stop is scheduled to be completed within the planning horizon included in a Transportation Improvement Program. A Major Transit Stop means: "a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service of 15 minutes or less during the morning and afternoon peak commute periods." An HQTA or Corridor is a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.

  Figure 4 depicts TPAs within unincorporated Orange County[3], including HQTA corridors served by the Orange County Transportation Authority with service intervals of 15 minutes or less and major transit stops along the Metrolink[4] system. Although the figure shows the San Clemente Pier Metrolink station, it does not qualify as a major transit stop because service is limited to weekends. Projects proposed in these areas would be presumed to have a less than significant transportation impact unless the project is inconsistent with the RTP/SCS, has an FAR less than 0.75, provides an excessive amount of parking, or reduces the number of affordable residential units.

- **Neighborhood Retail Project:** The project involves local-serving retail space of less than 50,000 square feet.

- **Affordable Housing Project:** The project is 100 percent affordable-housing units.

[3] Figure 4 may be updated periodically as necessary.

[4] Amtrak runs along Metrolink's Orange County route and stops at many Orange County Metrolink stations.

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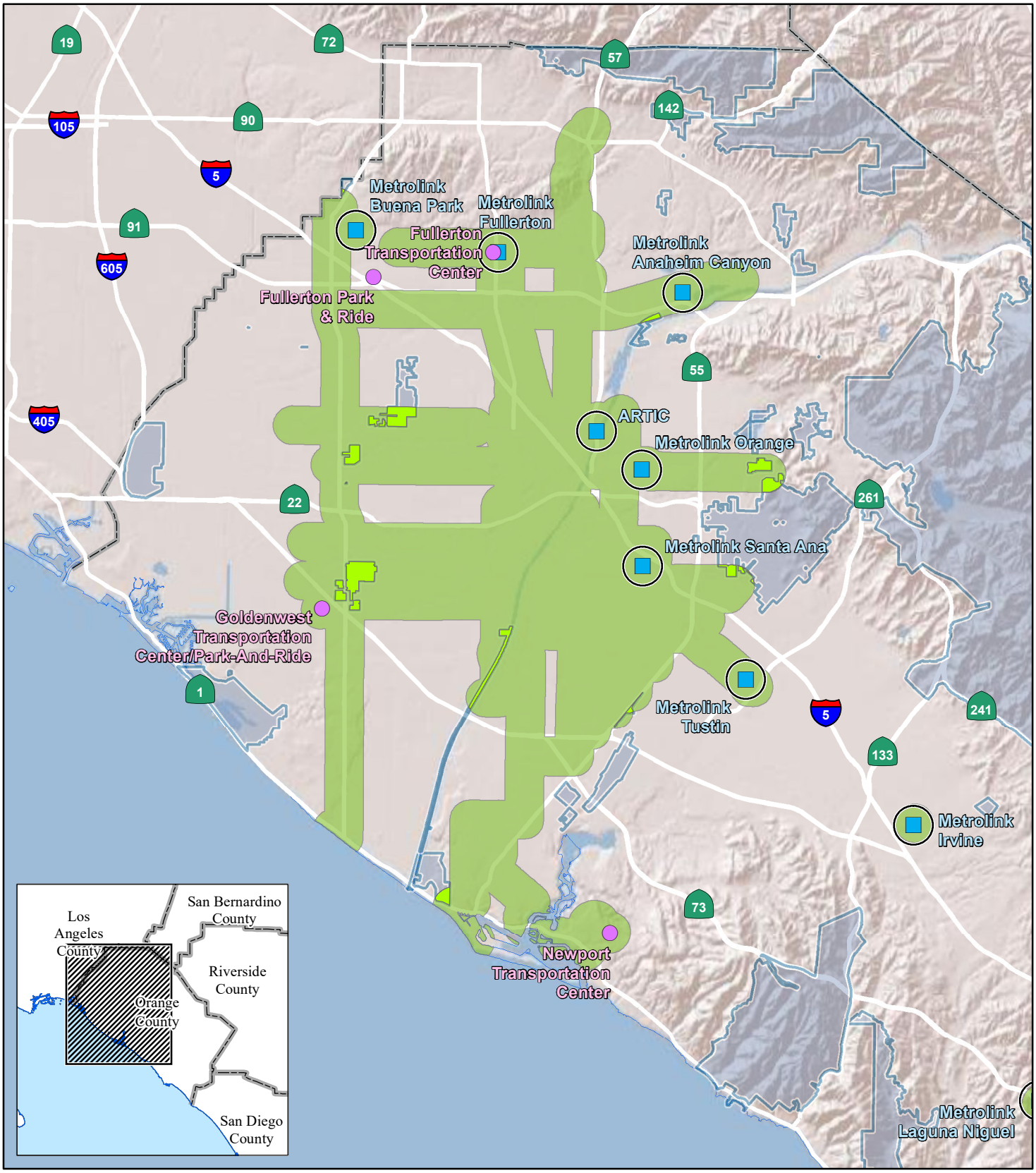

LSA

LEGEND

- Unincorporated Areas of Orange County
- High Quality Transit Areas
- Unincorporated Areas within High Quality Transit Areas
- Transportation Centers
- Metrolink Station (with half-mile buffer)

N

0 1.75 3.5
MILES

SOURCE: OCPW (3/2020), SCAG (6/2019); OCTA (11/2019); Bing (2019)

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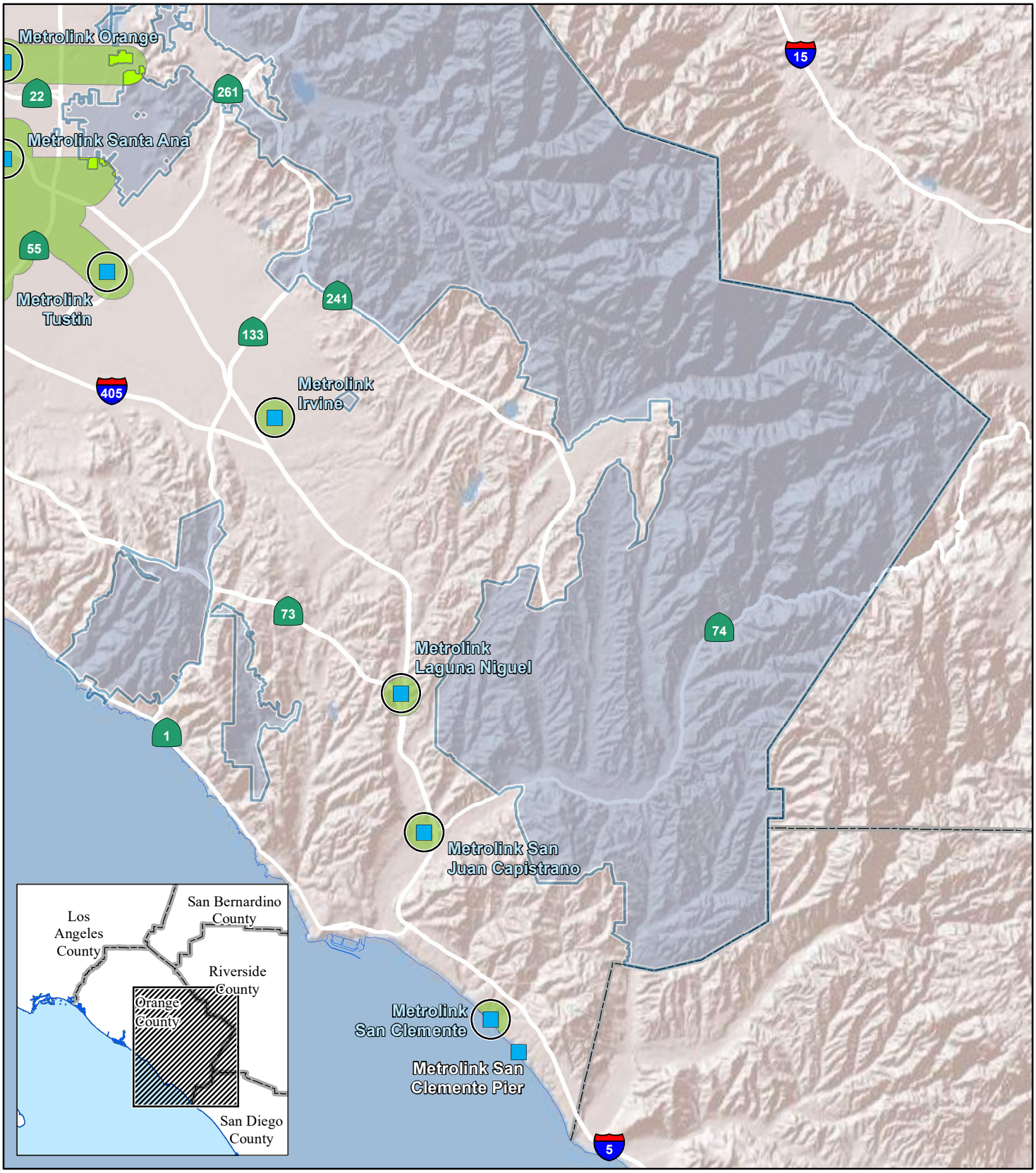
FIGURE 4
Sheet 1 of 2

CEQA Transportation Thresholds of Significance Guide

County of Orange Transit Priority Areas



LSA

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FIGURE 4
Sheet 2 of 2

CEQA Transportation Thresholds of Significance Guide

County of Orange Transit Priority Areas

- **Low VMT Area[5] Project:** The project is in low VMT areas. The applicant may submit data from the most recent OCTAM version showing the proposed project is within a low VMT area, which may be used, at the discretion of staff, to screen out the project.

- **Small Project:** A project generates 500 or fewer average daily trips (ADT). The TA recommends a volume of 110 ADT as the low volume that would allow the project to be screened out. This recommendation is not based on any analysis of GHG reduction, but was instead based on the potential trip generation of an office project that would already be categorically exempt under CEQA. LSA prepared a deeper analysis and used the California Emissions Estimator Model (CalEEMod, version 2016.3.2) to correlate the effect of changes in project-related ADT to the resulting GHG emissions. This model was selected because it is provided by the California Air Resources Board (CARB) to be used statewide for determining project-level GHG emissions. CalEEMod was used with the built-in default trip lengths and types to show the vehicular GHG emissions from incremental amounts of ADT. Table B shows the resulting annual VMT and GHG emissions from the incremental ADT.

Table B: Representative Vehicle VMT and GHG Emissions from CalEEMod

Average Daily Trips	Annual Vehicle Miles Traveled	GHG Emissions (metric tons CO_2e per year)
200	683,430	258
300	1,021,812	386
400	1,386,416	514
500	1,703,020	643
600	2,043,623	771

Source: CalEEMod version 2016.3.2. Example project used: 50 single-family Homes in Orange County.
CalEEMod = California Emissions Estimator Model
CO_2e = carbon dioxide equivalent
GHG = greenhouse gas

A common GHG emissions threshold is 3,000 metric tons (MT) of carbon dioxide equivalent[6] (CO_2e) per year. Vehicle emissions are typically more than 50 percent of the total project GHG emissions. Thus, a project with 500 ADT would generally have total project emissions that could be less than 1,300 MT CO_2e/year (i.e., 50 percent or 643 MT CO_2e/year coming from vehicle emissions and the other 50 percent coming from other project activities). As this level of GHG

5 Orange County's land area may be described in terms of low, medium and high VMT areas based on thresholds described in Chapter 4. These descriptions are Low: less 85 percent of the regional average; Medium: equal to or more than 85 percent of the regional average **and** less than or equal to 117 percent of regional average; and High: greater than 117 percent of regional average.

6 Carbon dioxide equivalent (CO_2e) is a concept developed to provide one metric that includes the effects of numerous GHGs. The global warming potential (GWP) of each GHG characterizes the ability of each GHG to trap heat in the atmosphere relative to another GHG. The GWPs of all GHGs are combined to derive the CO_2e.

emissions would be less than 3,000 MT CO_2e/year, the emissions of GHG from a project up to 500 ADT would typically be less than significant.

The County's current Transportation Implementation Manual establishes screening criteria of 200 ADT. However, based on the analysis in Table B, projects with fewer than 500 ADT are unlikely to result in significant impacts.

Based on this qualitative analysis, the County establishes screening criteria for small projects of up to 500 ADT.

- **Public Facilities:** The development of institutional/government and public service uses that support community health, safety or welfare are also screened from subsequent CEQA VMT analysis. The following includes some examples and is not an exhaustive list of public facilities that are screened from subsequent CEQA VMT analysis: police/sheriff stations, fire stations, community centers, refuse stations, jails, and landfills. These facilities are already part of the community and, as a public service, the VMT is accounted for in the existing regional average. Many of these facilities also generate fewer than 500 ADT and/or use vehicles other than passenger-cars or light duty trucks. These other vehicle fleets are subject to regulation outside of CEQA, such as CARB and the South Coast Air Quality Management District.

3.2 Transportation Projects

The primary attribute to consider with transportation projects is the potential to increase vehicle travel. While the County has discretion to continue to use delay analysis for CEQA disclosure of transportation projects, changes in vehicle travel must also be quantified.

The TA lists a series of projects that would not likely lead to a substantial or measurable increase in vehicle travel and that, therefore, would generally not require an induced travel analysis. The current list of projects, which is not intended to be exhaustive, includes the following examples:

- Rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets (e.g., highways; roadways; bridges; culverts; Transportation Management System field elements such as cameras, message signs, detection, or signals; tunnels; transit systems; and assets that serve bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity

- Roadside safety devices or hardware installation such median barriers and guardrails

- Roadway shoulder enhancements to provide "breakdown space," dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes

- Addition of an auxiliary lane of less than 1 mile in length designed to improve roadway safety

- Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left-, right-, and U-turn pockets, two-way left-turn lanes, or emergency breakdown lanes that are not utilized as through lanes
- Addition of roadway capacity on local or collector streets, provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit
- Conversion of existing general-purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel
- Addition of a new lane that is permanently restricted to use only by transit vehicles
- Reduction in the number of through lanes
- Grade separation to separate vehicles from rail, transit, pedestrians, or bicycles, or to replace a lane in order to separate preferential vehicles (e.g., high-occupancy vehicles [HOVs], high-occupancy toll [HOT] lane traffic, or trucks) from general vehicles
- Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features
- Installation of traffic metering systems, detection systems, cameras, changeable message signs, and other electronics designed to optimize vehicle, bicycle, or pedestrian flow
- Timing of signals to optimize vehicle, bicycle, or pedestrian flow
- Installation of roundabouts or traffic circles
- Installation or reconfiguration of traffic calming devices
- Adoption of or increase in tolls
- Addition of tolled lanes, where tolls are sufficient to mitigate VMT increase
- Initiation of a new transit service
- Conversion of streets from one-way to two-way operation with no net increase in the number of traffic lanes
- Removal or relocation of off-street or on-street parking spaces
- Adoption or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)
- Addition of traffic wayfinding signage

- Rehabilitation and maintenance projects that do not add motor vehicle capacity
- Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way
- Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve nonmotorized travel
- Installation of publicly available alternative fuel/charging infrastructure
- Addition of passing lanes, truck climbing lanes, or truck brake-check lanes in rural areas that do not increase overall vehicle capacity along the corridor

Additionally, transit and active transportation projects generally reduce VMT and are, therefore, presumed to cause a less than significant impact on transportation. This presumption may apply to all passenger rail projects, bus and bus rapid-transit projects, and bicycle and pedestrian infrastructure projects.

If the proposed project is consistent with the build out of the Orange County Master Plan of Arterial Highways (MPAH) network, then the project may have a less than significant impact.

4.0 SIGNIFICANCE THRESHOLDS FOR LAND DEVELOPMENT PROJECTS

The TA states that SB 743 and all CEQA VMT transportation analyses refer to automobiles. Here, the term automobile refers to on-road passenger vehicles, specifically cars and light-duty trucks (page. 4). Heavy-duty trucks can be addressed in other CEQA sections and are subject to regulation in a separate collection of rules under CARB jurisdiction. This approach was amplified by Chris Ganson, Chief Planner at OPR in a recent presentation at the Fresno Council of Governments (October 23, 2019) and by Ellen Greenberg, California Department of Transportation (Caltrans) Deputy Director for Sustainability, at the San Joaquin Valley Regional Planning Association meeting (January 9, 2020).

The OPR has identified the subject of the thresholds as the primary trips in the home-based typology: specifically, home-based work trips. This includes residential uses, office uses, and retail uses. The home-based work trip type is the primary tripmaking during the peak hours of commuter traffic in the morning and evening periods.

The focus of analyzing transportation impacts has shifted from congestion to climate change, and the purpose of the CEQA analysis is to disclose and ultimately reduce GHG emissions by reducing the number and length of automobile trips. This change in CEQA analysis does not diminish the County's ability to require an LOS analysis to confirm accessibility to a project site, conformance with General Plan policies, or as a function of their general health, safety, and welfare discretion and authority. As part of the SB 375 land use/transportation integration process and the GHG goal setting, most metropolitan planning organizations and regional transportation planning agencies have agreed to reduce GHG through integrated land use and transportation planning by approximately 15 percent by 2035. Furthermore, in its 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals, the CARB recommends total VMT per capita rates approximately 15 percent below existing conditions.

The TA therefore recommends:

> *A proposed (residential) project exceeding a level of 15 percent below existing regional average VMT per capita may indicate a significant transportation impact.*
>
> *A similar threshold would apply to office projects (15 percent below existing regional average VMT per employee).*
>
> *VMT generated by retail projects would indicate a significant impact for any net increase in total VMT.*

While regional planning documents such as the RTP/SCS calculate a single VMT rate by dividing total VMT for the SCAG region by the total service population, it should be noted that the TA identifies a different denominator for the residential and office comparison rates. If regional average VMT per capita and VMT per employee were calculated using the service population (population plus employment), the denominator would be the same, which would be inconsistent with the TA. Furthermore, using service population to calculate regional average rates would complicate future project analyses.

The environmental document for a proposed land use project will identify population for a residential project and employment for an office project. These values should be used in the transportation analysis to calculate the project's VMT per capita or VMT per employee. If a project's VMT per capita (VMT/project population) or VMT per employee (VMT/project employment) is compared to a regional average based on service rate (VMT/[regional population + employment]), the comparison is not equivalent.

According to the Orange County Transportation Authority calculations using OCTAM 5.0, the average VMT/capita in Orange County is 17.9. The average VMT/employee in Orange County is 24.1.

Mixed-use projects should be evaluated for each component of the project independently, or the County may use the predominant land use type for the analysis. Credit for internal trip capture should be accounted for. No discrete land use types other than residential, office, or retail are identified for threshold development in the TA.

The TA suggests that the County may, but is not required to, develop thresholds for any other use. One approach is to review the County General Plan and/or Countywide Long-Range Transportation Plan (LRTP) and identify whether the implementation of the plan would result in a reduction of VMT and GHGs. If it does, the County may conclude the implementation of the plan, including all the other land use types to achieve the regional climate change goals. Therefore, consistency with the plan and no net change in VMT per employee is a rational threshold for the other land use types. This approach would require disclosure of substantial evidence, including the General Plan or LRTP findings, and other supporting traffic and air quality forecasting support.

4.1 Summary

In summary, the County's thresholds of significance for the following land uses are:

- **Residential –** 15 percent below existing regional average VMT per capita (17.9 X 0.85 = 15.2)
- **Office –** 15 percent below existing regional average VMT per employee (24.1 X 0.85 = 20.5)
- **Retail –** no net change in total VMT
- **Mixed Use:** consider each component of the project separately based on the threshold for residential, office, retail, etc. and take credit for internal capture
- **Other Land Uses –** no net change in VMT per employee if consistent with the General Plan or 15 percent below regional average if seeking a General Plan Amendment

Figure 5 demonstrates the potential land development entitlement process to comply with the Guidelines related to VMT and transportation impacts. It provides the path from application filing through determination of impacts. It is presented as the standard process; each development application is considered unique and may create alternative or modified steps through the process. Each step that diverges from this standard process should be accompanied with substantial

evidence demonstrating compliance with other climate change and GHG emission reduction laws and regulations.

4.2 Agency Communication

At the outset of the project development process, the applicant should seek a meeting with County staff to discuss the project description, the transportation study content, and the analysis methodology. Key elements to address include describing the project in sufficient detail to generate trips and identify the potential catchment area (i.e., trip lengths, if no modeling is being undertaken), estimating project VMT, discussing project design features that may reduce the VMT from the project development, and discussing the project location and associated existing regional VMT percentages. As a result of the meeting, the applicant or their consultant shall prepare a transportation analysis scope of work for review and approval by the County.

4.3 Project Screening

Once a development application is filed, project screening is conducted as the initial step. If the project meets any one of the screening criteria for VMT, the project may be presumed to create a less than significant impact in the area of transportation and circulation and no further analysis as to this topical environmental area is necessary. The CEQA document should enumerate the screening criteria and how the project meets or exceeds that threshold. If project screening does not apply, a VMT analysis may be required, in accordance with CEQA. The extent of this analysis may be a simple algebraic demonstration or a more sophisticated traffic modeling exercise.

4.4 Project VMT Analysis

The first step is to identify the project land use type and the appropriate efficiency rate to use. If the project is residential, use the per capita (or residential population) efficiency rate. If the project is commercial office (or a similar trip generator), use the per employee efficiency rate. For retail projects, use the total VMT generated by the project. For mixed use projects, report each land use after generating trips, taking credit for internal trip capture, to arrive at the VMT. As an alternative, the predominant use may be reported for mixed-use projects. For all other uses, use the VMT per employee as the comparative.

4.4.1 Medium Project VMT Analysis

For medium-sized projects (projects generating greater than 500 ADT but less than 1,000 ADT) or those with one predominant use, the determination of project VMT may be identified manually as the product of the daily trip generation (land use density/intensity multiplied by the County-approved trip generation rates, usually the ITE Trip Generation Manual) and the trip length in miles for that specific land use. Trip lengths can be found in other related air quality tools, such as CalEEMod, or may be derived from OCTAM.

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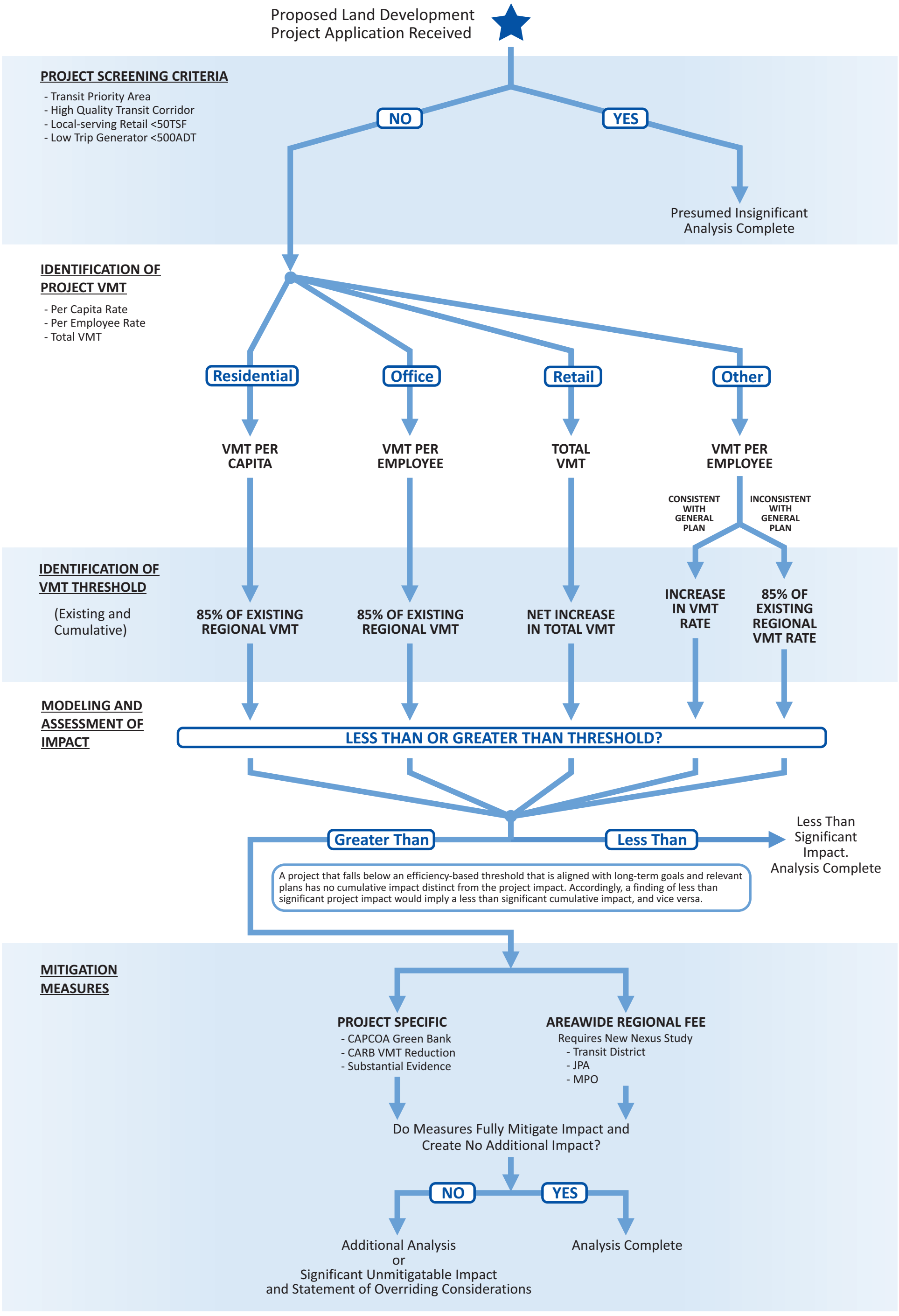

LSA

FIGURE 5

CEQA Transportation Thresholds of Significance Guide

Transportation Impacts Flow Chart for Land Development Projects

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4.4.2 Large Project VMT Analysis

For large or multi-use projects, use of the OCTAM traffic forecasting tool is required. For purposes of County review, a project generating 1,000 ADT or more should use the OCTAM traffic forecasting tool. At this level of trip generating, the probability of trip fulfilment expands to an area greater than the immediate project location and may include a greater regional attraction. The OCTAM traffic forecasting tool can more accurately define the select links used and the total VMT generated by the project.

Next, the project generated efficiency rate, or total VMT, depending on project type, is compared to the appropriate significance threshold. **This is either 85 percent of the existing regional average per capita or employment (for the County) for residential and office uses, or no net increase in total VMT for retail or other uses that are consistent with the General Plan.** For those projects that require a General Plan Amendment, 85 percent of existing regional average is appropriate, as the project has yet to be evaluated as part of the County's ultimate land development vision.

If the project VMT (expressed as a per capita or per employee rate or total number) is at or less than the significance threshold, the project is presumed to create a less than significant impact. No further analysis is required. If the project is greater than the significance threshold, mitigation measures are required.

4.5 Mitigation Measures

The applicant is required, per CEQA, to identify feasible mitigation to mitigate the impact created by the project, to a level that is less than significant. Appendices A and B list some ideas for potential mitigation strategies. This is not an exhaustive list of feasible mitigation measures that may be applied to the project. As in previous CEQA practice, the applicant/project proponent will be required to identify mitigation measures to reduce, avoid, or offset the specific project-related impacts identified in an individual environmental document. Thus, the applicant should submit other creative, feasible mitigation for their project. The mitigation measures suggested and the related VMT percentage reduction must be reviewed and either approved or rejected by the County.

If the mitigation measures mitigate the project impact to a less than significant level, no further analysis is required. If the project's VMT impact cannot be fully mitigated, the County may: 1) request the project be redesigned, relocated, or realigned to reduce the VMT impact, or 2) prepare a Statement of Overriding Considerations (SOC) for the transportation impacts associated with the project. All feasible mitigation measures must be assigned to and carried out by the project, even if a SOC is prepared.

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5.0 SIGNIFICANCE THRESHOLDS FOR TRANSPORTATION PROJECTS

Section 15064.3.b.(2) of the Guidelines reads in part:

> *For roadway capacity projects, agencies have the discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements.*

The County may continue to use delay and LOS for transportation projects as long as impacts related to "other applicable requirements" are disclosed. This has generally been interpreted as VMT impacts and other State climate change objectives. These other applicable requirements may be found in other parts of an environmental document (i.e., air quality, GHG), or may be provided in greater detail in the transportation section.

For projects on the State highway system, Caltrans will use and will require sponsoring agencies to use VMT as the CEQA metric, and Caltrans will evaluate the VMT "attributable to the project" (Caltrans Draft VMT-Focused Transportation Impact Study Guide, February 28, 2020). Caltrans' Intergovernmental Review will review environmental documents for capacity-enhancing projects for the County's analysis of VMT change.

The assessment of a transportation project's VMT should disclose the VMT without the project and the difference in VMT with the project. According to the TA, any growth in VMT attributable to the transportation project would result in a significant impact.

The primary difference in these two scenarios (without the project and with the project) to OPR is related to induced growth. Current traffic models have limited abilities to forecast induced growth, as their land use or socioeconomic databases are fixed to a horizon date. OPR refers to a limited set of reports that would indicate elasticities. The most recent major study (Duranton & Turner 2011, p. 24) estimates an elasticity of 1.0, meaning that every 1 percent change in lane miles results in a 1 percent increase in VMT.

The TA presents one method to identify the induced growth, as shown below. This method may be used in Orange County to estimate induced growth attributable to new roadway capacity.

> *To estimate VMT impacts from roadway expansion projects:*
>
> 1. *Determine the total lane-miles over an area that fully captures travel behavior changes resulting from the project (generally the region, but for projects affecting interregional travel look at all affected regions).*
> 2. *Determine the percentage change in total lane miles that will result from the project.*
> 3. *Determine the total existing VMT over that same area.*
> 4. *Multiply the percentage increase in lane miles by the existing VMT, and then multiply that by the elasticity from the induced travel literature:*
>
> *[% increase in lane miles] x [existing VMT] x [elasticity] = [VMT resulting from the project]*

It should be pointed out that OPR assigns this induced growth to induced land use.

As an alternative method, Caltrans has identified a computerized tool that estimates VMT generation from transportation projects. It was developed at the University of California, Davis, and is based on elasticities and the relationship of lane mile additions and growth in VMT. It uses Federal Highway Administration definitions of facility type and ascribes VMT increases to each facility. Output includes increases on million vehicle miles per year. Caltrans is investigating its use for all its VMT analyses of capital projects. It is available for use by local agencies and applicants, and the County may recommend utilization of this tool for calculations.

The TA provides other options to identify induced growth- and project-related VMT. These include:

1. *Employ an expert panel. An expert panel could assess changes to land use development that would likely result from the project. This assessment could then be analyzed by the travel demand model to assess effects on vehicle travel. Induced vehicle travel assessed via this approach should be verified using elasticities found in the academic literature.*

2. Adjust model results to align with the empirical research. *If the travel demand model analysis is performed without incorporating projected land use changes resulting from the project, the assessed vehicle travel should be adjusted upward to account for those land use changes. The assessed VMT after adjustment should fall within the range found in the academic literature.*

3. Employ a land use model, running it iteratively with a travel demand model. *A land use model can be used to estimate the land use effects of a roadway capacity increase, and the traffic patterns that result from the land use change can then be fed back into the travel demand model. The land use model and travel demand model can be iterated to produce an accurate result.*

The TA provides additional guidance, below:

> *Whenever employing a travel demand model to assess induced vehicle travel, any limitation or known lack of sensitivity in the analysis that might cause substantial errors in the VMT estimate (for example, model insensitivity to one of the components of induced VMT described above) should be disclosed and characterized, and a description should be provided on how it could influence the analysis results. A discussion of the potential error or bias should be carried into analyses that rely on the VMT analysis, such as greenhouse gas emissions, air quality, energy, and noise.*

The threshold for significance for a capacity-enhancing roadway project or new roadway project is any additional VMT generated by the project either due to the increased roadway use or as a result of induced growth attributable to the project.[7]

[7] Overall, new roadway projects are generally capacity-enhancing. However, these project may show a short-term VMT reduction due to intervening paths or reduced travel times. But long-term effects may include induced growth due to more desirable travel opportunities and/or increased land development and new trip generation. The net project effect takes into consideration the changes in the whole system as opposed to what happens on the proposed facility in question.

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6.0 SIGNIFICANCE THRESHOLDS FOR LAND PLANS

In the TA, the OPR provided guidance on the treatment of CEQA traffic analyses for land use plans. The TA reiterates previous direction regarding individual land use assessments:

- Analyze the VMT outcomes over the full area over which the plan may substantively affect travel patterns (the definition of region).

- VMT should be counted in full rather than split between origins and destinations (the full impact of the project VMT).

The TA provides a single sentence as consideration for land use plans. It states, *"A general plan, area plan, or community plan may have a significant impact on transportation if proposed new residential, office or retail land uses would in aggregate exceed the respective thresholds recommended above."* This recommendation refers to 85 percent of the existing city or regional average, and no net gain for residential, office, and retail land uses.

OPR is recommending a focus on specific trip purposes (i.e., home-based trips for residential projects and work-based trips for office projects). Depending on the modeling platform, at least four other trip types are recognized as contributors to large-scale plan-level analyses. Home-based origins will have interactions with other non-work-based destinations. Therefore, if home-based trips are the focus of a plan-level assessment, a great deal of VMT would not be accounted for in the estimation of total VMT.

To assess a land plan, use of a traffic-forecasting tool is recommended. The total VMT for the plan should be identified for all trip types and all potential VMT contributors within the plan area. Similar traffic model runs should be conducted for the existing base year and the horizon year with No Project.

The SB 375 process and the Regional Targets Advisory Committee GHG goal setting has established a baseline GHG emissions reduction that local Metropolitan Planning Organizations (MPOs) and Regional Transportation Planning Agencies (RTPAs) can achieve. These achievements are provided in the integration of land use planning and transportation, not solely through the imposition of regulation on passenger cars and light-duty trucks. The CARB reviews the GHG reduction strategies and has approved the most recent round of GHG emission reductions for MPOs and RTPAs around the State.

Other legislative mandates and State policies speak to GHG reduction targets. A sample of these include:

- Assembly Bill 32 (2006) requires statewide GHG emissions reductions to 1990 levels by 2020 and continued reductions beyond 2020.

- SB 32 (2016) requires at least a 40 percent reduction in GHG emissions from 1990 levels by 2030.

- Executive Order (EO) B-30-15 (2015) sets a GHG emissions reduction target of 40 percent below 1990 levels by 2030.

- EO S-3-05 (2005) sets a GHG emissions reduction target of 80 percent below 1990 levels by 2050.

- EO B-16-12 (2012) specifies a GHG emissions reduction target of 80 percent below 1990 levels by 2050 specifically for transportation.

Guidelines Section 15064.3(b)(4) states (in part) the following:

> *A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household, or in any other measure.*

Therefore, the recommended methodology for conducting VMT assessments for land plans is to compare the existing VMT per capita for the land plan area with the expected horizon year VMT per service population (population and employment). The recommended target is to achieve a lower VMT per service population in the horizon year with the proposed land plan than occurs for the existing condition.

7.0 MITIGATION STRATEGIES

When a significant CEQA impact is identified according to the thresholds described above, the project proponent will be required to identify feasible mitigation measures in order to reduce, avoid, or offset the impact. Although previous vehicle LOS impacts could be mitigated with location-specific vehicle level of service improvements, VMT impacts likely require mitigation of regional impacts through more behavioral changes. Enforcement of mitigation measures will still be subject to the mitigation monitoring requirements of CEQA, as well as the regular police powers of the County. These measures can also be incorporated as a part of plans, policies, regulations, or project designs.

7.1 Definition of Mitigation

Section 15370 of the Guidelines defines mitigations as follows:

> *"Mitigation" includes:*
>
> *a. Avoiding the impact altogether by not taking a certain action or parts of an action.*
>
> *b. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.*
>
> *c. Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment.*
>
> *d. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.*
>
> *e. Compensating for the impact by replacing or providing substitute resources or environments, including through permanent protection of such resources in the form of conservation easements.*

Section 15097 of the Guidelines states that "the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it has imposed to mitigate or avoid significant environmental effects."

VMT mitigations are not necessarily physical improvements; rather, they are complex in nature and will significantly depend on changes in human behavior.

Section 21099 (b) (4) of the PRC states, "This subdivision [requiring a new transportation metric under CEQA] does not preclude the application of local general plan policies, zoning codes, conditions of approval, thresholds, or any other planning requirements pursuant to the police power or any other authority." Thus, despite the fact that automobile delay will no longer be considered a significant impact under CEQA, the County can still require projects to meet the LOS standards designated in its zoning code or general plan. Many projects will likely still be required to propose LOS improvements for congestion relief in addition to VMT strategies as CEQA mitigation measures.

7.2 Mitigation Measures and Project Alternatives

7.2.1 Land Development Projects and Community/General Plans

Mitigations and project alternatives for VMT impacts have been suggested by the OPR and are included in the TA. VMT mitigation can be extremely diverse and can be classified under several categories such as land use/location, road pricing, transit improvements, commute trip reduction strategies, and parking pricing/policy. Improvements related to VMT reduction strategies have been quantified in sources such as the California Air Pollution Control Officers Association (CAPCOA) report *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA Green Book) and CARB sources and are generally presented in wide ranges of potential VMT reduction percentages.

Appendix B provides a brief menu of the different potentially applicable VMT mitigation measures and project alternatives stated in the CAPCOA Green Book (only those strategies directly attributed to transportation) and the OPR TA for land development projects. This discussion does not present an exhaustive list of feasible mitigation measures that may be applied to a project. As in previous CEQA practice, the applicant/project proponent will be required to identify mitigation measures to the County to reduce, avoid, or offset the specific project-related impacts identified in an individual environmental document.

As additional mitigation measures are developed to offset VMT impacts in the future for the Guidelines process, linkages between the strategy and the incremental effect and quantified offset must be made. This can be based on other sources' observations and measurements or County experience in these practices. The key to mitigation is to base its efficacy on real and substantial evidence.

7.2.2 Transportation Projects

Although OPR provides detailed guidance on how to assess induced-growth impacts associated with transportation projects, it leaves the subject of mitigation measures vague. Only four strategies are suggested as mitigation measures:

- Tolling new lanes to encourage carpools and fund transit improvements
- Converting existing general-purpose lanes to HOV or HOT lanes
- Implementing or funding off-site travel demand management
- Implementing Intelligent Transportation Systems strategies to improve passenger throughput on existing lanes

No quantified reduction percentage is allocated to these strategies, and LSA could find no substantial evidence that would provide guidance to levels of significance after implementation of these strategies. Review of the four recommended strategies suggests that OPR is directing strategies away from general-purpose mixed-flow lanes on expressways, freeways, and arterial highways. Inasmuch as these are the project descriptions and Purpose and Need, the project intent and the project mitigation may be at odds. The County may be subject to an SOC for the capital project VMT impact.

APPENDIX A

TECHNICAL ADVISORY ON EVALUATING TRANSPORTATION IMPACTS IN CEQA (OPR, DECEMBER 2018)

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TECHNICAL ADVISORY

ON EVALUATING TRANSPORTATION IMPACTS IN CEQA

December 2018

Contents

A. Introduction

This technical advisory is one in a series of advisories provided by the Governor's Office of Planning and Research (OPR) as a service to professional planners, land use officials, and CEQA practitioners. OPR issues technical assistance on issues that broadly affect the practice of land use planning and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). (Gov. Code, § 65040, subds. (g), (l), (m).) The purpose of this document is to provide advice and recommendations, which agencies and other entities may use at their discretion. This document does not alter lead agency discretion in preparing environmental documents subject to CEQA. This document should not be construed as legal advice.

Senate Bill 743 (Steinberg, 2013), which was codified in Public Resources Code section 21099, required changes to the guidelines implementing CEQA (CEQA Guidelines) (Cal. Code Regs., Title 14, Div. 6, Ch. 3, § 15000 et seq.) regarding the analysis of transportation impacts. As one appellate court recently explained: "During the last 10 years, the Legislature has charted a course of long-term sustainability based on denser infill development, reduced reliance on individual vehicles and improved mass transit, all with the goal of reducing greenhouse gas emissions. Section 21099 is part of that strategy . . . ." (*Covina Residents for Responsible Development v. City of Covina* (2018) 21 Cal.App.5th 712, 729.) Pursuant to Section 21099, the criteria for determining the significance of transportation impacts must "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." (*Id.*, subd. (b)(1); see generally, adopted CEQA Guidelines, § 15064.3, subd. (b) [Criteria for Analyzing Transportation Impacts].) To that end, in developing the criteria, OPR has proposed, and the California Natural Resources Agency (Agency) has certified and adopted, changes to the CEQA Guidelines that identify vehicle miles traveled (VMT) as the most appropriate metric to evaluate a project's transportation impacts. With the California Natural Resources Agency's certification and adoption of the changes to the CEQA Guidelines, automobile delay, as measured by "level of service" and other similar metrics, generally no longer constitutes a significant environmental effect under CEQA. (Pub. Resources Code, § 21099, subd. (b)(3).)

This advisory contains technical recommendations regarding assessment of VMT, thresholds of significance, and mitigation measures. Again, OPR provides this Technical Advisory as a resource for the public to use at their discretion. OPR is not enforcing or attempting to enforce any part of the recommendations contained herein. (Gov. Code, § 65035 ["It is not the intent of the Legislature to vest in the Office of Planning and Research any direct operating or regulatory powers over land use, public works, or other state, regional, or local projects or programs."].)

This December 2018 technical advisory is an update to the advisory it published in April 2018. OPR will continue to monitor implementation of these new provisions and may update or supplement this advisory in response to new information and advancements in modeling and methods.

B. Background

VMT and Greenhouse Gas Emissions Reduction. Senate Bill 32 (Pavley, 2016) requires California to reduce greenhouse gas (GHG) emissions 40 percent below 1990 levels by 2030, and Executive Order B-16-12 provides a target of 80 percent below 1990 emissions levels for the transportation sector by 2050. The transportation sector has three major means of reducing GHG emissions: increasing vehicle efficiency, reducing fuel carbon content, and reducing the amount of vehicle travel. The California Air Resources Board (CARB) has provided a path forward for achieving these emissions reductions from the transportation sector in its 2016 Mobile Source Strategy. CARB determined that it will not be possible to achieve the State's 2030 and post-2030 emissions goals without reducing VMT growth. Further, in its 2018 Progress Report on California's Sustainable Communities and Climate Protection Act, CARB found that despite the State meeting its 2020 climate goals, "emissions from statewide passenger vehicle travel per capita [have been] increasing and going in the wrong direction," and "California cannot meet its [long-term] climate goals without curbing growth in single-occupancy vehicle activity."[1] CARB also found that "[w]ith emissions from the transportation sector continuing to rise despite increases in fuel efficiency and decreases in the carbon content of fuel, California will not achieve the necessary greenhouse gas emissions reductions to meet mandates for 2030 and beyond without significant changes to how communities and transportation systems are planned, funded, and built."[2]

Thus, to achieve the State's long-term climate goals, California needs to reduce per capita VMT. This can occur under CEQA through VMT mitigation. Half of California's GHG emissions come from the transportation sector[3], therefore, reducing VMT is an effective climate strategy, which can also result in co-benefits.[4] Furthermore, without early VMT mitigation, the state may follow a path that meets GHG targets in the early years, but finds itself poorly positioned to meet more stringent targets later. For example, in absence of VMT analysis and mitigation in CEQA, lead agencies might rely upon verifiable offsets for GHG mitigation, ignoring the longer-term climate change impacts resulting from land use development and infrastructure investment decisions. As stated in CARB's 2017 Scoping Plan:

> "California's future climate strategy will require increased focus on integrated land use planning to support livable, transit-connected communities, and conservation of agricultural and other lands. Accommodating population and economic growth through travel- and energy-efficient land use provides GHG-efficient growth, reducing GHGs from both transportation and building energy use. GHGs can be further reduced at the project level through implementing energy-efficient construction and travel demand management approaches."[5] (*Id.* at p. 102.)

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[1] California Air Resources Board (Nov. 2018) *2018 Progress Report on California's Sustainable Communities and Climate Protection Act*, pp. 4, 5, available at https://ww2.arb.ca.gov/sites/default/files/2018-11/Final2018Report_SB150_112618_02_Report.pdf.
[2] *Id.*, p. 28.
[3] See https://ca50million.ca.gov/transportation/
[4] Fang et al. (2017) *Cutting Greenhouse Gas Emissions Is Only the Beginning: A Literature Review of the Co-Benefits of Reducing Vehicle Miles Traveled*.
[5] California Air Resources Board (Nov. 2017) *California's 2017 Climate Change Scoping Plan*, p. 102, available at https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf.

In light of this, the 2017 Scoping Plan describes and quantifies VMT reductions needed to achieve our long-term GHG emissions reduction goals, and specifically points to the need for statewide deployment of the VMT metric in CEQA:

> "Employing VMT as the metric of transportation impact statewide will help to ensure GHG reductions planned under SB 375 will be achieved through on-the-ground development, and will also play an important role in creating the additional GHG reductions needed beyond SB 375 across the State. Implementation of this change will rely, in part, on local land use decisions to reduce GHG emissions associated with the transportation sector, both at the project level, and in long-term plans (including general plans, climate action plans, specific plans, and transportation plans) and supporting sustainable community strategies developed under SB 375."[6]

VMT and Other Impacts to Health and Environment. VMT mitigation also creates substantial benefits (sometimes characterized as "co-benefits" to GHG reduction) in both in the near-term and the long-term. Beyond GHG emissions, increases in VMT also impact human health and the natural environment. Human health is impacted as increases in vehicle travel lead to more vehicle crashes, poorer air quality, increases in chronic diseases associated with reduced physical activity, and worse mental health. Increases in vehicle travel also negatively affect other road users, including pedestrians, cyclists, other motorists, and many transit users. The natural environment is impacted as higher VMT leads to more collisions with wildlife and fragments habitat. Additionally, development that leads to more vehicle travel also tends to consume more energy, water, and open space (including farmland and sensitive habitat). This increase in impermeable surfaces raises the flood risk and pollutant transport into waterways.[7]

VMT and Economic Growth. While it was previously believed that VMT growth was a necessary component of economic growth, data from the past two decades shows that economic growth is possible without a concomitant increase in VMT. (Figure 1.) Recent research shows that requiring development projects to mitigate LOS may actually reduce accessibility to destinations and impede economic growth.[8,9]

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[6] *Id.* at p. 76.

[7] Fang et al. (2017) *Cutting Greenhouse Gas Emissions Is Only the Beginning: A Literature Review of the Co-Benefits of Reducing Vehicle Miles Traveled*, available at https://ncst.ucdavis.edu/wp-content/uploads/2017/03/NCST-VMT-Co-Benefits-White-Paper_Fang_March-2017.pdf.

[8] Haynes et al. (Sept. 2015) *Congested Development: A Study of Traffic Delays, Access, and Economic Activity in Metropolitan Los Angeles*, available at http://www.its.ucla.edu/wp-content/uploads/sites/6/2015/11/Haynes_Congested-Development_1-Oct-2015_final.pdf.

[9] Osman et al. (Mar. 2016) *Not So Fast: A Study of Traffic Delays, Access, and Economic Activity in the San Francisco Bay Area*, available at http://www.its.ucla.edu/wp-content/uploads/sites/6/2016/08/Taylor-Not-so-Fast-04-01-2016_final.pdf.

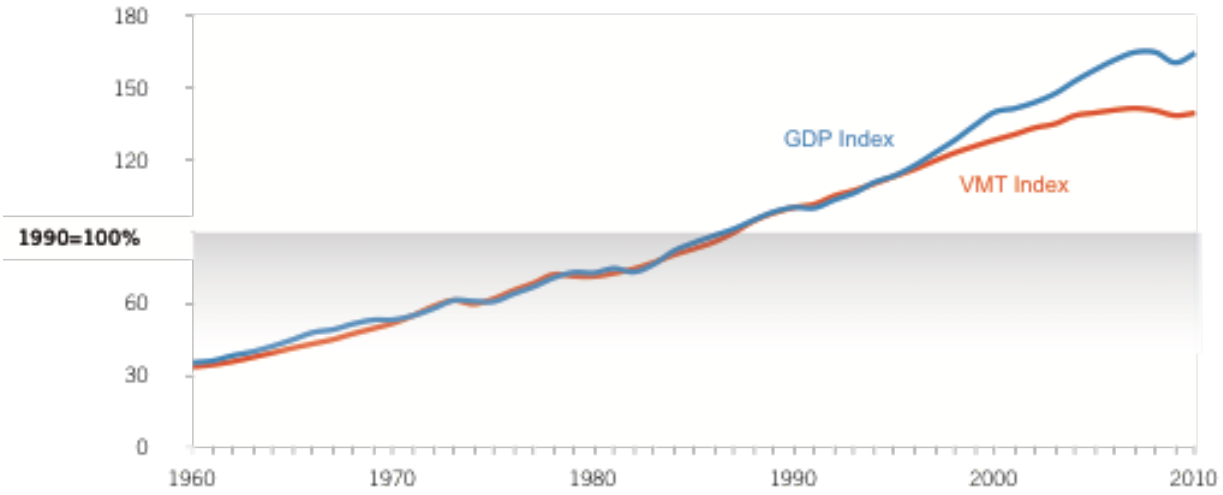

Figure 1. Kooshian and Winkelman (2011) *VMT and Gross Domestic Product (GDP), 1960-2010*.

C. Technical Considerations in Assessing Vehicle Miles Traveled

Many practitioners are familiar with accounting for VMT in connection with long-range planning, or as part of the CEQA analysis of a project's greenhouse gas emissions or energy impacts. This document provides technical information on how to assess VMT as part of a transportation impacts analysis under CEQA. Appendix 1 provides a description of which VMT to count and options on how to count it. Appendix 2 provides information on induced travel resulting from roadway capacity projects, including the mechanisms giving rise to induced travel, the research quantifying it, and information on additional approaches for assessing it.

1. Recommendations Regarding Methodology

Proposed Section 15064.3 explains that a "lead agency may use models to estimate a project's vehicle miles traveled . . . ." CEQA generally defers to lead agencies on the choice of methodology to analyze impacts. (*Santa Monica Baykeeper v. City of Malibu* (2011) 193 Cal.App.4th 1538, 1546; see *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 409 ["the issue is not whether the studies are irrefutable or whether they could have been better" … rather, the "relevant issue is only whether the studies are sufficiently credible to be considered" as part of the lead agency's overall evaluation].) This section provides suggestions to lead agencies regarding methodologies to analyze VMT associated with a project.

Vehicle Types. Proposed Section 15064.3, subdivision (a), states, "For the purposes of this section, 'vehicle miles traveled' refers to the amount and distance of automobile travel attributable to a project." Here, the term "automobile" refers to on-road passenger vehicles, specifically cars and light trucks. Heavy-duty truck VMT could be included for modeling convenience and ease of calculation (for example, where models or data provide combined auto and heavy truck VMT). For an apples-to-apples

comparison, vehicle types considered should be consistent across project assessment, significance thresholds, and mitigation.

Residential and Office Projects. Tour- and trip-based approaches[10] offer the best methods for assessing VMT from residential/office projects and for comparing those assessments to VMT thresholds. These approaches also offer the most straightforward methods for assessing VMT reductions from mitigation measures for residential/office projects. When available, tour-based assessment is ideal because it captures travel behavior more comprehensively. But where tour-based tools or data are not available for all components of an analysis, a trip-based assessment of VMT serves as a reasonable proxy.

Models and methodologies used to calculate thresholds, estimate project VMT, and estimate VMT reduction due to mitigation should be comparable. For example:

- A tour-based assessment of project VMT should be compared to a tour-based threshold, or a trip-based assessment to a trip-based VMT threshold.
- Where a travel demand model is used to determine thresholds, the same model should also be used to provide trip lengths as part of assessing project VMT.
- Where only trip-based estimates of VMT reduction from mitigation are available, a trip-based threshold should be used, and project VMT should be assessed in a trip-based manner.

When a trip-based method is used to analyze a residential project, the focus can be on home-based trips. Similarly, when a trip-based method is used to analyze an office project, the focus can be on home-based work trips.

When tour-based models are used to analyze an office project, either employee work tour VMT or VMT from all employee tours may be attributed to the project. This is because workplace location influences overall travel. For consistency, the significance threshold should be based on the same metric: either employee work tour VMT or VMT from all employee tours.

For office projects that feature a customer component, such as a government office that serves the public, a lead agency can analyze the customer VMT component of the project using the methodology for retail development (see below).

Retail Projects. Generally, lead agencies should analyze the effects of a retail project by assessing the change in total VMT[11] because retail projects typically re-route travel from other retail destinations. A retail project might lead to increases or decreases in VMT, depending on previously existing retail travel patterns.

[10] See Appendix 1, *Considerations About Which VMT to Count,* for a description of these approaches.
[11] See Appendix 1, *Considerations About Which VMT to Count, "*Assessing Change in Total VMT" section, for a description of this approach.

Considerations for All Projects. Lead agencies should not truncate any VMT analysis because of jurisdictional or other boundaries, for example, by failing to count the portion of a trip that falls outside the jurisdiction or by discounting the VMT from a trip that crosses a jurisdictional boundary. CEQA requires environmental analyses to reflect a "good faith effort at full disclosure." (CEQA Guidelines, § 15151.) Thus, where methodologies exist that can estimate the full extent of vehicle travel from a project, the lead agency should apply them to do so. Where those VMT effects will grow over time, analyses should consider both a project's short-term and long-term effects on VMT.

Combining land uses for VMT analysis is not recommended. Different land uses generate different amounts of VMT, so the outcome of such an analysis could depend more on the mix of uses than on their travel efficiency. As a result, it could be difficult or impossible for a lead agency to connect a significance threshold with an environmental policy objective (such as a target set by law), inhibiting the CEQA imperative of identifying a project's significant impacts and providing mitigation where feasible. Combining land uses for a VMT analysis could streamline certain mixes of uses in a manner disconnected from policy objectives or environmental outcomes. Instead, OPR recommends analyzing each use separately, or simply focusing analysis on the dominant use, and comparing each result to the appropriate threshold. Recommendations for methods of analysis and thresholds are provided below. In the analysis of each use, a mixed-use project should take credit for internal capture.

Any project that includes in its geographic bounds a portion of an existing or planned Transit Priority Area (i.e., the project is within a ½ mile of an existing or planned major transit stop or an existing stop along a high quality transit corridor) may employ VMT as its primary metric of transportation impact for the entire project. (See Pub. Resources Code, § 21099, subds. (a)(7), (b)(1).)

Cumulative Impacts. A project's cumulative impacts are based on an assessment of whether the "incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." (Pub. Resources Code, § 21083, subd. (b)(2); see CEQA Guidelines, § 15064, subd. (h)(1).) When using an absolute VMT metric, i.e., total VMT (as recommended below for retail and transportation projects), analyzing the combined impacts for a cumulative impacts analysis may be appropriate. However, metrics such as VMT per capita or VMT per employee, i.e., metrics framed in terms of efficiency (as recommended below for use on residential and office projects), cannot be summed because they employ a denominator. A project that falls below an efficiency-based threshold that is aligned with long-term environmental goals and relevant plans would have no cumulative impact distinct from the project impact. Accordingly, a finding of a less-than-significant project impact would imply a less than significant cumulative impact, and vice versa. This is similar to the analysis typically conducted for greenhouse gas emissions, air quality impacts, and impacts that utilize plan compliance as a threshold of significance. (See *Center for Biological Diversity v. Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 219, 223; CEQA Guidelines, § 15064, subd. (h)(3).)

D. General Principles to Guide Consideration of VMT

SB 743 directs OPR to establish specific "criteria for determining the significance of transportation impacts of projects[.]" (Pub. Resources Code, § 21099, subd. (b)(1).) In establishing this criterion, OPR was guided by the general principles contained within CEQA, the CEQA Guidelines, and applicable case law.

To assist in the determination of significance, many lead agencies rely on "thresholds of significance." The CEQA Guidelines define a "threshold of significance" to mean "an identifiable **quantitative, qualitative[12] or performance level** of a particular environmental effect, non-compliance with which means the effect will ***normally*** be determined to be significant by the agency and compliance with which means the effect ***normally*** will be determined to be less than significant." (CEQA Guidelines, § 15064.7, subd. (a) (emphasis added).) Lead agencies have discretion to develop and adopt their own, or rely on thresholds recommended by other agencies, "provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence." (*Id*. at subd. (c); *Save Cuyama Valley v. County of Santa Barbara* (2013) 213 Cal.App.4th 1059, 1068.) Substantial evidence means "enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached." (*Id*. at § 15384 (emphasis added); *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1108-1109.)

Additionally, the analysis leading to the determination of significance need not be perfect. The CEQA Guidelines describe the standard for adequacy of environmental analyses:

> An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to **make a decision which intelligently takes account of environmental consequences**. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is **reasonably feasible**. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The **courts have looked not for perfection** but for **adequacy**, **completeness**, and a **good faith effort** at full disclosure.

(CEQA Guidelines, § 15151 (emphasis added).)

These general principles guide OPR's recommendations regarding thresholds of significance for VMT set forth below.

[12] Generally, qualitative analyses should only be conducted when methods do not exist for undertaking a quantitative analysis.

E. Recommendations Regarding Significance Thresholds

As noted above, lead agencies have the discretion to set or apply their own thresholds of significance. (*Center for Biological Diversity v. California Dept. of Fish & Wildlife* (2015) 62 Cal.4th 204, 218-223 [lead agency had discretion to use compliance with AB 32's emissions goals as a significance threshold]; *Save Cuyama Valley v. County of Santa Barbara* (2013) 213 Cal.App.4th at p. 1068.) However, Section 21099 of the Public Resources Code states that the criteria for determining the significance of transportation impacts must promote: (1) reduction of greenhouse gas emissions; (2) development of multimodal transportation networks; and (3) a diversity of land uses. It further directed OPR to prepare and develop criteria for determining significance. (Pub. Resources Code, § 21099, subd. (b)(1).) This section provides OPR's suggested thresholds, as well as considerations for lead agencies that choose to adopt their own thresholds.

The VMT metric can support the three statutory goals: "the reduction of greenhouse gas emissions, the development of multimodal transportation networks, ***and*** a diversity of land uses." (Pub. Resources Code, § 21099, subd. (b)(1), emphasis added.) However, in order for it to promote and support all three, lead agencies should select a significance threshold that aligns with state law on all three. State law concerning the development of multimodal transportation networks and diversity of land uses requires planning for and prioritizing increases in complete streets and infill development, but does not mandate a particular depth of implementation that could translate into a particular threshold of significance. Meanwhile, the State has clear quantitative targets for GHG emissions reduction set forth in law and based on scientific consensus, and the depth of VMT reduction needed to achieve those targets has been quantified. Tying VMT thresholds to GHG reduction also supports the two other statutory goals. Therefore, to ensure adequate analysis of transportation impacts, OPR recommends using quantitative VMT thresholds linked to GHG reduction targets when methods exist to do so.

Various legislative mandates and state policies establish quantitative greenhouse gas emissions reduction targets. For example:

- Assembly Bill 32 (2006) requires statewide GHG emissions reductions to 1990 levels by 2020 and continued reductions beyond 2020.

- Senate Bill 32 (2016) requires at least a 40 percent reduction in GHG emissions from 1990 levels by 2030.

- Pursuant to Senate Bill 375 (2008), the California Air Resources Board GHG emissions reduction targets for metropolitan planning organizations (MPOs) to achieve based on land use patterns and transportation systems specified in Regional Transportation Plans and Sustainable Community Strategies (RTP/SCS). Current targets for the State's largest MPOs call for a 19 percent reduction in GHG emissions from cars and light trucks from 2005 emissions levels by 2035.

- Executive Order B-30-15 (2015) sets a GHG emissions reduction target of 40 percent below 1990 levels by 2030.

- Executive Order S-3-05 (2005) sets a GHG emissions reduction target of 80 percent below 1990 levels by 2050.

- Executive Order B-16-12 (2012) specifies a GHG emissions reduction target of 80 percent below 1990 levels by 2050 specifically for transportation.

- Executive Order B-55-18 (2018) established an additional statewide goal of achieving carbon neutrality as soon as possible, but no later than 2045, and maintaining net negative emissions thereafter. It states, "The California Air Resources Board shall work with relevant state agencies to develop a framework for implementation and accounting that tracks progress toward this goal."

- Senate Bill 391 requires the California Transportation Plan to support 80 percent reduction in GHGs below 1990 levels by 2050.

- The *California Air Resources Board Mobile Source Strategy* (2016) describes California's strategy for containing air pollutant emissions from vehicles, and quantifies VMT growth compatible with achieving state targets.

- The California Air Resources Board's *2017 Climate Change Scoping Plan Update: The Strategy for Achieving California's 2030 Greenhouse Gas Target* describes California's strategy for containing GHG emissions from vehicles, and quantifies VMT growth compatible with achieving state targets.

Considering these various targets, the California Supreme Court observed:

> Meeting our statewide reduction goals does not preclude all new development. Rather, the Scoping Plan … assumes continued growth and depends on increased efficiency and conservation in land use and transportation from all Californians.

(*Center for Biological Diversity v. California Dept. of Fish & Wildlife*, *supra*, 62 Cal.4th at p. 220.) Indeed, the Court noted that when a lead agency uses consistency with climate goals as a way to determine significance, particularly for long-term projects, the lead agency must consider the project's effect on meeting long-term reduction goals. (*Ibid*.) And more recently, the Supreme Court stated that "CEQA requires public agencies . . . to ensure that such analysis stay in step with evolving scientific knowledge and state regulatory schemes." (*Cleveland National Forest Foundation v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497, 504.)

Meeting the targets described above will require substantial reductions in existing VMT per capita to curb GHG emissions and other pollutants. But targets for overall GHG emissions reduction do not translate directly into VMT thresholds for individual projects for many reasons, including:

- Some, but not all, of the emissions reductions needed to achieve those targets could be accomplished by other measures, including increased vehicle efficiency and decreased fuel carbon content. The CARB's *First Update to the Climate Change Scoping Plan* explains:

"Achieving California's long-term criteria pollutant and GHG emissions goals will require four strategies to be employed: (1) improve vehicle efficiency and develop zero emission technologies, (2) reduce the carbon content of fuels and provide market support to get these lower-carbon fuels into the marketplace, (3) **plan and build communities to reduce vehicular GHG emissions and provide more transportation options, and (4) improve the efficiency and throughput of existing transportation systems.**"[13] CARB's *2018 Progress Report on California's Sustainable Communities and Climate Protection Act* states on page 28 that "California cannot meet its climate goals without curbing growth in single-occupancy vehicle activity." In other words, vehicle efficiency and better fuels are necessary, but insufficient, to address the GHG emissions from the transportation system. Land use patterns and transportation options also will need to change to support reductions in vehicle travel/VMT.

- New land use projects alone will not sufficiently reduce per-capita VMT to achieve those targets, nor are they expected to be the sole source of VMT reduction.

- Interactions between land use projects, and also between land use and transportation projects, existing and future, together affect VMT.

- Because location within the region is the most important determinant of VMT, in some cases, streamlining CEQA review of projects in travel efficient locations may be the most effective means of reducing VMT.

- When assessing climate impacts of some types of land use projects, use of an efficiency metric (e.g., per capita, per employee) may provide a better measure of impact than an absolute numeric threshold. (*Center for Biological Diversity*, *supra*.)

Public Resources Code section 21099 directs OPR to propose criteria for determining the significance of transportation impacts. In this Technical Advisory, OPR provides its recommendations to assist lead agencies in selecting a significance threshold that may be appropriate for their particular projects. While OPR's Technical Advisory is not binding on public agencies, CEQA allows lead agencies to "consider thresholds of significance . . . recommended by other public agencies, provided the decision to adopt those thresholds is supported by substantial evidence." (CEQA Guidelines, § 15064.7, subd. (c).) Based on OPR's extensive review of the applicable research, and in light of an assessment by the California Air Resources Board quantifying the need for VMT reduction in order to meet the State's long-term climate goals, **OPR recommends that a per capita or per employee VMT that is fifteen percent below that of existing development may be a reasonable threshold**.

Fifteen percent reductions in VMT are achievable at the project level in a variety of place types.[14]

Moreover, a fifteen percent reduction is consistent with SB 743's direction to OPR to select a threshold that will help the State achieve its climate goals. As described above, section 21099 states that the

[13] California Air Resources Board (May 2014) *First Update to the Climate Change Scoping Plan*, p. 46 (emphasis added).
[14] CAPCOA (2010) *Quantifying Greenhouse Gas Mitigation Measures*, p. 55, available at http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

criteria for determining significance must "promote the reduction in greenhouse gas emissions." In its document *California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*[15], CARB assesses VMT reduction per capita consistent with its evidence-based modeling scenario that would achieve State climate goals of 40 percent GHG emissions reduction from 1990 levels by 2030 and 80 percent GHG emissions reduction levels from 1990 by 2050. Applying California Department of Finance population forecasts, CARB finds per-capita light-duty vehicle travel would need to be approximately 16.8 percent lower than existing, and overall per-capita vehicle travel would need to be approximately 14.3 percent lower than existing levels under that scenario. Below these levels, a project could be considered low VMT and would, on that metric, be consistent with 2017 Scoping Plan Update assumptions that achieve climate state climate goals.

CARB finds per capita vehicle travel would need to be kept below what today's policies and plans would achieve.

CARB's assessment is based on data in the 2017 Scoping Plan Update and 2016 Mobile Source Strategy. In those documents, CARB previously examined the relationship between VMT and the state's GHG emissions reduction targets. The Scoping Plan finds:

> "While the State can do more to accelerate and incentivize these local decisions, local actions that reduce VMT are also necessary to meet transportation sector-specific goals and achieve the 2030 target under SB 32. Through developing the Scoping Plan, CARB staff is more convinced than ever that, in addition to achieving GHG reductions from cleaner fuels and vehicles, California must also reduce VMT. Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward needed reductions, but alone will not provide the VMT growth reductions needed; there is a gap between what SB 375 can provide and what is needed to meet the State's 2030 and 2050 goals."[16]

Note that, at present, consistency with RTP/SCSs does not necessarily lead to a less-than-significant VMT impact.[17] As the Final 2017 Scoping Plan Update states,

> VMT reductions are necessary to achieve the 2030 target and must be part of any strategy evaluated in this Plan. Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward this goal, but alone will not provide all of the VMT growth reductions that will be needed. There is a gap between what SB 375 can provide and what is needed to meet the State's 2030 and 2050 goals."[18]

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[15] California Air Resources Board (Jan. 2019) *California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*, available at https://ww2.arb.ca.gov/resources/documents/carb-2017-scoping-plan-identified-vmt-reductions-and-relationship-state-climate.

[16] California Air Resources Board (Nov. 2017) *California's 2017 Climate Change Scoping Plan*, p. 101.

[17] California Air Resources Board (Feb. 2018) *Updated Final Staff Report: Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets*, Figure 3, p. 35, available at https://www.arb.ca.gov/cc/sb375/sb375_target_update_final_staff_report_feb2018.pdf.

[18] California Air Resources Board (Nov. 2017) *California's 2017 Climate Change Scoping Plan*, p. 75.

Also, in order to capture the full effects of induced travel resulting from roadway capacity projects, an RTP/SCS would need to include an assessment of land use effects of those projects, and the effects of those land uses on VMT. (See section titled "*Estimating VMT Impacts from Transportation Projects"* below.) RTP/SCSs typically model VMT using a collaboratively-developed land use "vision" for the region's land use, rather than studying the effects on land use of the proposed transportation investments.

In summary, achieving 15 percent lower per capita (residential) or per employee (office) VMT than existing development is both generally achievable and is supported by evidence that connects this level of reduction to the State's emissions goals.

1. Screening Thresholds for Land Use Projects

Many agencies use "screening thresholds" to quickly identify when a project should be expected to cause a less-than-significant impact without conducting a detailed study. (See e.g., CEQA Guidelines, §§ 15063(c)(3)(C), 15128, and Appendix G.) As explained below, this technical advisory suggests that lead agencies may screen out VMT impacts using project size, maps, transit availability, and provision of affordable housing.

Screening Threshold for Small Projects

Many local agencies have developed screening thresholds to indicate when detailed analysis is needed. Absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with a Sustainable Communities Strategy (SCS) or general plan, projects that generate or attract fewer than 110 trips per day[19] generally may be assumed to cause a less-than-significant transportation impact.

Map-Based Screening for Residential and Office Projects

Residential and office projects that locate in areas with low VMT, and that incorporate similar features (i.e., density, mix of uses, transit accessibility), will tend to exhibit similarly low VMT. Maps created with VMT data, for example from a travel survey or a travel demand model, can illustrate areas that are

[19] CEQA provides a categorical exemption for existing facilities, including additions to existing structures of up to 10,000 square feet, so long as the project is in an area where public infrastructure is available to allow for maximum planned development and the project is not in an environmentally sensitive area. (CEQA Guidelines, § 15301, subd. (e)(2).) Typical project types for which trip generation increases relatively linearly with building footprint (i.e., general office building, single tenant office building, office park, and business park) generate or attract an additional 110-124 trips per 10,000 square feet. Therefore, absent substantial evidence otherwise, it is reasonable to conclude that the addition of 110 or fewer trips could be considered not to lead to a significant impact.

currently below threshold VMT (see recommendations below). Because new development in such locations would likely result in a similar level of VMT, such maps can be used to screen out residential and office projects from needing to prepare a detailed VMT analysis.

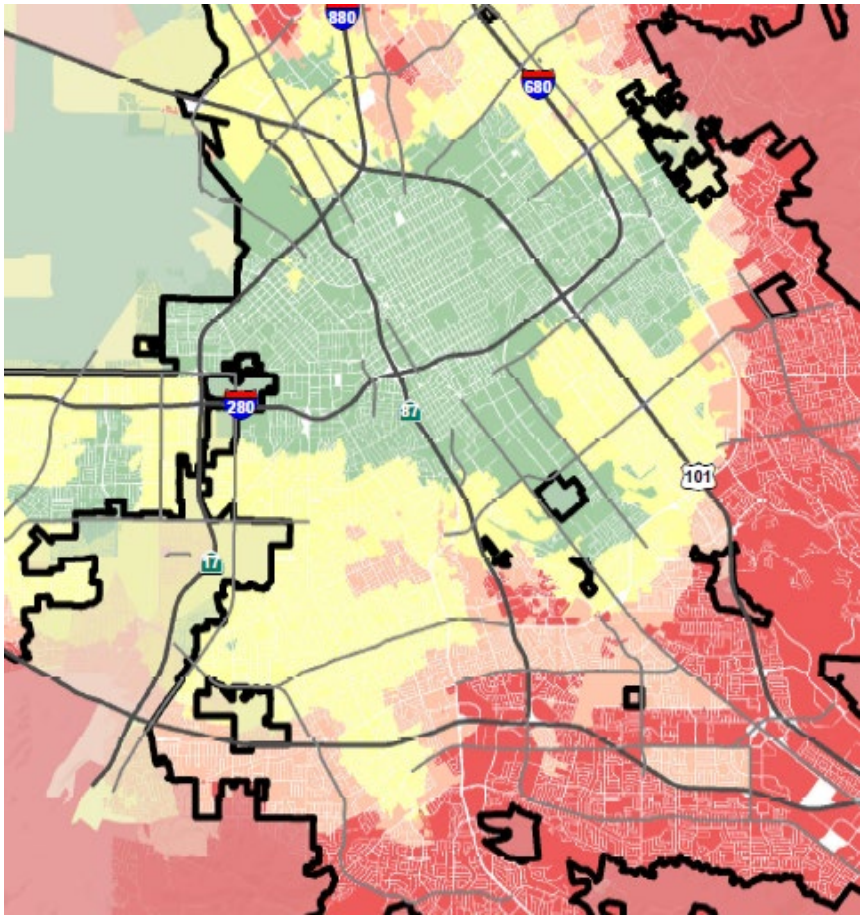

Figure 2. Example map of household VMT that could be used to delineate areas eligible to receive streamlining for VMT analysis. (Source: City of San José, Department of Transportation, draft output of City Transportation Model.)

Presumption of Less Than Significant Impact Near Transit Stations

Proposed CEQA Guideline Section 15064.3, subdivision (b)(1), states that lead agencies generally should presume that certain projects (including residential, retail, and office projects, as well as projects that are a mix of these uses) proposed within ½ mile of an existing major transit stop[20] or an existing stop

[20] Pub. Resources Code, § 21064.3 ("'Major transit stop' means a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods.").

along a high quality transit corridor[21] will have a less-than-significant impact on VMT. This presumption would not apply, however, if project-specific or location-specific information indicates that the project will still generate significant levels of VMT. For example, the presumption might not be appropriate if the project:

- Has a Floor Area Ratio (FAR) of less than 0.75
- Includes more parking for use by residents, customers, or employees of the project than required by the jurisdiction (if the jurisdiction requires the project to supply parking)
- Is inconsistent with the applicable Sustainable Communities Strategy (as determined by the lead agency, with input from the Metropolitan Planning Organization)
- Replaces affordable residential units with a smaller number of moderate- or high-income residential units

A project or plan near transit which replaces affordable residential units[22] with a smaller number of moderate- or high-income residential units may increase overall VMT because the increase in VMT of displaced residents could overwhelm the improvements in travel efficiency enjoyed by new residents.[23]

If any of these exceptions to the presumption might apply, the lead agency should conduct a detailed VMT analysis to determine whether the project would exceed VMT thresholds (see below).

Presumption of Less Than Significant Impact for Affordable Residential Development

Adding affordable housing to infill locations generally improves jobs-housing match, in turn shortening commutes and reducing VMT.[24,25] Further, "… low-wage workers in particular would be more likely to choose a residential location close to their workplace, if one is available."[26] In areas where existing jobs-housing match is closer to optimal, low income housing nevertheless generates less VMT than market-

[21] Pub. Resources Code, § 21155 ("For purposes of this section, a high-quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.").
[22] Including naturally-occurring affordable residential units.
[23] Chapple et al. (2017) *Developing a New Methodology for Analyzing Potential Displacement,* Chapter 4, pp. 159-160, available at https://www.arb.ca.gov/research/apr/past/13-310.pdf.
[24] Karner and Benner (2016) *The convergence of social equity and environmental sustainability: Jobs-housing fit and commute distance* ("[P]olicies that advance a more equitable distribution of jobs and housing by linking the affordability of locally available housing with local wage levels are likely to be associated with reduced commuting distances").
[25] Karner and Benner (2015) *Low-wage jobs-housing fit: identifying locations of affordable housing shortages.*
[26] Karner and Benner (2015) *Low-wage jobs-housing fit: identifying locations of affordable housing shortages.*

rate housing.[27,28] Therefore, a project consisting of a high percentage of affordable housing may be a basis for the lead agency to find a less-than-significant impact on VMT. Evidence supports a presumption of less than significant impact for a 100 percent affordable residential development (or the residential component of a mixed-use development) in infill locations. Lead agencies may develop their own presumption of less than significant impact for residential projects (or residential portions of mixed use projects) containing a particular amount of affordable housing, based on local circumstances and evidence. Furthermore, a project which includes any affordable residential units may factor the effect of the affordability on VMT into the assessment of VMT generated by those units.

2. Recommended Numeric Thresholds for Residential, Office, and Retail Projects

Recommended threshold for residential projects: A proposed project exceeding a level of 15 percent below existing VMT per capita may indicate a significant transportation impact. Existing VMT per capita may be measured as regional VMT per capita or as city VMT per capita. Proposed development referencing a threshold based on city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the number of units specified in the SCS for that city, and should be consistent with the SCS.

Residential development that would generate vehicle travel that is 15 or more percent below the existing residential VMT per capita, measured against the region or city, may indicate a less-than-significant transportation impact. In MPO areas, development measured against city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the population or number of units specified in the SCS for that city because greater-than-planned amounts of development in areas above the region-based threshold would undermine the VMT containment needed to achieve regional targets under SB 375.

For residential projects in unincorporated county areas, the local agency can compare a residential project's VMT to (1) the region's VMT per capita, or (2) the aggregate population-weighted VMT per capita of all cities in the region. In MPO areas, development in unincorporated areas measured against aggregate city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the population or number of units specified in the SCS for that city because greater-than-planned amounts of development in areas above the regional threshold would undermine achievement of regional targets under SB 375.

[27] Chapple et al. (2017) *Developing a New Methodology for Analyzing Potential Displacement*, available at https://www.arb.ca.gov/research/apr/past/13-310.pdf.
[28] CAPCOA (2010) *Quantifying Greenhouse Gas Mitigation Measures*, pp. 176-178, available at http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

These thresholds can be applied to either household (i.e., tour-based) VMT or home-based (i.e., trip-based) VMT assessments.[29] It is critical, however, that the agency be consistent in its VMT measurement approach throughout the analysis to maintain an "apples-to-apples" comparison. For example, if the agency uses a home-based VMT for the threshold, it should also be use home-based VMT for calculating project VMT and VMT reduction due to mitigation measures.

Recommended threshold for office projects: A proposed project exceeding a level of 15 percent below existing regional VMT per employee may indicate a significant transportation impact.

Office projects that would generate vehicle travel exceeding 15 percent below existing VMT per employee for the region may indicate a significant transportation impact. In cases where the region is substantially larger than the geography over which most workers would be expected to live, it might be appropriate to refer to a smaller geography, such as the county, that includes the area over which nearly all workers would be expected to live.

Office VMT screening maps can be developed using tour-based data, considering either total employee VMT or employee work tour VMT. Similarly, tour-based analysis of office project VMT could consider either total employee VMT or employee work tour VMT. Where tour-based information is unavailable for threshold determination, project assessment, or assessment of mitigation, home-based work trip VMT should be used throughout all steps of the analysis to maintain an "apples-to-apples" comparison.

Recommended threshold for retail projects: A net increase in total VMT may indicate a significant transportation impact.

Because new retail development typically redistributes shopping trips rather than creating new trips,[30] estimating the total change in VMT (i.e., the difference in total VMT in the area affected with and without the project) is the best way to analyze a retail project's transportation impacts.

By adding retail opportunities into the urban fabric and thereby improving retail destination proximity, local-serving retail development tends to shorten trips and reduce VMT. Thus, lead agencies generally may presume such development creates a less-than-significant transportation impact. Regional-serving retail development, on the other hand, which can lead to substitution of longer trips for shorter ones, may tend to have a significant impact. Where such development decreases VMT, lead agencies should consider the impact to be less-than-significant.

Many cities and counties define local-serving and regional-serving retail in their zoning codes. Lead agencies may refer to those local definitions when available, but should also consider any project-

[29] See Appendix 1 for a description of these approaches.
[30] Lovejoy, et al. (2013) *Measuring the impacts of local land-use policies on vehicle miles of travel: The case of the first big-box store in Davis, California, The Journal of Transport and Land Use*.

specific information, such as market studies or economic impacts analyses that might bear on customers' travel behavior. Because lead agencies will best understand their own communities and the likely travel behaviors of future project users, they are likely in the best position to decide when a project will likely be local-serving. Generally, however, retail development including stores larger than 50,000 square feet might be considered regional-serving, and so lead agencies should undertake an analysis to determine whether the project might increase or decrease VMT.

Mixed-Use Projects

Lead agencies can evaluate each component of a mixed-use project independently and apply the significance threshold for each project type included (e.g., residential and retail). Alternatively, a lead agency may consider only the project's dominant use. In the analysis of each use, a project should take credit for internal capture. Combining different land uses and applying one threshold to those land uses may result in an inaccurate impact assessment.

Other Project Types

Of land use projects, residential, office, and retail projects tend to have the greatest influence on VMT. For that reason, OPR recommends the quantified thresholds described above for purposes of analysis and mitigation. Lead agencies, using more location-specific information, may develop their own more specific thresholds, which may include other land use types. In developing thresholds for other project types, or thresholds different from those recommended here, lead agencies should consider the purposes described in section 21099 of the Public Resources Code and regulations in the CEQA Guidelines on the development of thresholds of significance (e.g., CEQA Guidelines, § 15064.7).

Strategies and projects that decrease local VMT but increase total VMT should be avoided. Agencies should consider whether their actions encourage development in a less travel-efficient location by limiting development in travel-efficient locations.

Redevelopment Projects

Where a project replaces existing VMT-generating land uses, if the replacement leads to a net overall decrease in VMT, the project would lead to a less-than-significant transportation impact. If the project leads to a net overall increase in VMT, then the thresholds described above should apply.

As described above, a project or plan near transit which replaces affordable[31] residential units with a smaller number of moderate- or high-income residential units may increase overall VMT, because

[31] Including naturally-occurring affordable residential units.

displaced residents' VMT may increase.[32] A lead agency should analyze VMT for such a project even if it otherwise would have been presumed less than significant. The assessment should incorporate an estimate of the aggregate VMT increase experienced by displaced residents. That additional VMT should be included in the numerator of the VMT per capita assessed for the project.

If a residential or office project leads to a net increase in VMT, then the project's VMT per capita (residential) or per employee (office) should be compared to thresholds recommended above. Per capita and per employee VMT are efficiency metrics, and, as such, apply only to the existing project without regard to the VMT generated by the previously existing land use.

If the project leads to a net increase in provision of locally-serving retail, transportation impacts from the retail portion of the development should be presumed to be less than significant. If the project consists of regionally-serving retail, and increases overall VMT compared to with existing uses, then the project would lead to a significant transportation impact.

RTP/SCS Consistency (All Land Use Projects)

Section 15125, subdivision (d), of the CEQA Guidelines provides that lead agencies should analyze impacts resulting from inconsistencies with regional plans, including regional transportation plans. For this reason, if a project is inconsistent with the Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS), the lead agency should evaluate whether that inconsistency indicates a significant impact on transportation. For example, a development may be inconsistent with an RTP/SCS if the development is outside the footprint of development or within an area specified as open space as shown in the SCS.

3. Recommendations Regarding Land Use Plans

As with projects, agencies should analyze VMT outcomes of land use plans across the full area over which the plan may substantively affect travel patterns, including beyond the boundary of the plan or jurisdiction's geography. And as with projects, VMT should be counted in full rather than split between origin and destination. (Emissions inventories have sometimes spit cross-boundary trips in order to sum to a regional total, but CEQA requires accounting for the full impact without truncation or discounting). Analysis of specific plans may employ the same thresholds described above for projects. A general plan, area plan, or community plan may have a significant impact on transportation if proposed new residential, office, or retail land uses would in aggregate exceed the respective thresholds recommended above. Where the lead agency tiers from a general plan EIR pursuant to CEQA Guidelines sections 15152 and 15166, the lead agency generally focuses on the environmental impacts that are specific to the later project and were not analyzed as significant impacts in the prior EIR. (Pub. Resources Code, § 21068.5; Guidelines, § 15152, subd. (a).) Thus, in analyzing the later project, the lead agency

[32] Chapple et al. (2017) *Developing a New Methodology for Analyzing Potential Displacement,* Chapter 4, pp. 159-160, available at https://www.arb.ca.gov/research/apr/past/13-310.pdf.

would focus on the VMT impacts that were not adequately addressed in the prior EIR. In the tiered document, the lead agency should continue to apply the thresholds recommended above.

Thresholds for plans in non-MPO areas may be determined on a case-by-case basis.

4. Other Considerations

Rural Projects Outside of MPOs

In rural areas of non-MPO counties (i.e., areas not near established or incorporated cities or towns), fewer options may be available for reducing VMT, and significance thresholds may be best determined on a case-by-case basis. Note, however, that clustered small towns and small town main streets may have substantial VMT benefits compared to isolated rural development, similar to the transit oriented development described above.

Impacts to Transit

Because criteria for determining the significance of transportation impacts must promote "the development of multimodal transportation networks" pursuant to Public Resources Code section 21099, subd. (b)(1), lead agencies should consider project impacts to transit systems and bicycle and pedestrian networks. For example, a project that blocks access to a transit stop or blocks a transit route itself may interfere with transit functions. Lead agencies should consult with transit agencies as early as possible in the development process, particularly for projects that are located within one half mile of transit stops.

When evaluating impacts to multimodal transportation networks, lead agencies generally should not treat the addition of new transit users as an adverse impact. An infill development may add riders to transit systems and the additional boarding and alighting may slow transit vehicles, but it also adds destinations, improving proximity and accessibility. Such development also improves regional vehicle flow by adding less vehicle travel onto the regional network.

Increased demand throughout a region may, however, cause a cumulative impact by requiring new or additional transit infrastructure. Such impacts may be adequately addressed through a fee program that fairly allocates the cost of improvements not just to projects that happen to locate near transit, but rather across a region to all projects that impose burdens on the entire transportation system, since transit can broadly improve the function of the transportation system.

F. Considering the Effects of Transportation Projects on Vehicle Travel

Many transportation projects change travel patterns. A transportation project which leads to additional vehicle travel on the roadway network, commonly referred to as "induced vehicle travel," would need to quantify the amount of additional vehicle travel in order to assess air quality impacts, greenhouse gas emissions impacts, energy impacts, and noise impacts. Transportation projects also are required to

examine induced growth impacts under CEQA. (See generally, Pub. Resources Code, §§ 21065 [defining "project" under CEQA as an activity as causing either a direct or reasonably foreseeable indirect physical change], 21065.3 [defining "project-specific effect" to mean all direct or indirect environmental effects], 21100, subd. (b) [required contents of an EIR].) For any project that increases vehicle travel, explicit assessment and quantitative reporting of the amount of additional vehicle travel should not be omitted from the document; such information may be useful and necessary for a full understanding of a project's environmental impacts. (See Pub. Resources Code, §§ 21000, 21001, 21001.1, 21002, 21002.1 [discussing the policies of CEQA].) A lead agency that uses the VMT metric to assess the transportation impacts of a transportation project may simply report that change in VMT as the impact. When the lead agency uses another metric to analyze the transportation impacts of a roadway project, changes in amount of vehicle travel added to the roadway network should still be analyzed and reported.[33]

While CEQA does not require perfection, it is important to make a reasonably accurate estimate of transportation projects' effects on vehicle travel in order to make reasonably accurate estimates of GHG emissions, air quality emissions, energy impacts, and noise impacts. (See, e.g., *California Clean Energy Com. v. City of Woodland* (2014) 225 Cal.App.4th 173, 210 [EIR failed to consider project's transportation energy impacts]; *Ukiah Citizens for Safety First v. City of Ukiah* (2016) 248 Cal.App.4th 256, 266.) Appendix 2 describes in detail the causes of induced vehicle travel, the robust empirical evidence of induced vehicle travel, and how models and research can be used in conjunction to quantitatively assess induced vehicle travel with reasonable accuracy.

If a project would likely lead to a measurable and substantial increase in vehicle travel, the lead agency should conduct an analysis assessing the amount of vehicle travel the project will induce. Project types that would likely lead to a measurable and substantial increase in vehicle travel generally include:

- Addition of through lanes on existing or new highways, including general purpose lanes, HOV lanes, peak period lanes, auxiliary lanes, or lanes through grade-separated interchanges

Projects that would not likely lead to a substantial or measurable increase in vehicle travel, and therefore generally should not require an induced travel analysis, include:

- Rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets (e.g., highways; roadways; bridges; culverts; Transportation Management System field elements such as cameras, message signs, detection, or signals; tunnels; transit systems; and assets that serve bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity
- Roadside safety devices or hardware installation such as median barriers and guardrails

[33] See, e.g., California Department of Transportation (2006) *Guidance for Preparers of Growth-related, Indirect Impact Analyses*, available at http://www.dot.ca.gov/ser/Growth-related_IndirectImpactAnalysis/GRI_guidance06May_files/gri_guidance.pdf.

- Roadway shoulder enhancements to provide “breakdown space,” dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes
- Addition of an auxiliary lane of less than one mile in length designed to improve roadway safety
- Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left, right, and U-turn pockets, two-way left turn lanes, or emergency breakdown lanes that are not utilized as through lanes
- Addition of roadway capacity on local or collector streets provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit
- Conversion of existing general purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel
- Addition of a new lane that is permanently restricted to use only by transit vehicles
- Reduction in number of through lanes
- Grade separation to separate vehicles from rail, transit, pedestrians or bicycles, or to replace a lane in order to separate preferential vehicles (e.g., HOV, HOT, or trucks) from general vehicles
- Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features
- Installation of traffic metering systems, detection systems, cameras, changeable message signs and other electronics designed to optimize vehicle, bicycle, or pedestrian flow
- Timing of signals to optimize vehicle, bicycle, or pedestrian flow
- Installation of roundabouts or traffic circles
- Installation or reconfiguration of traffic calming devices
- Adoption of or increase in tolls
- Addition of tolled lanes, where tolls are sufficient to mitigate VMT increase
- Initiation of new transit service
- Conversion of streets from one-way to two-way operation with no net increase in number of traffic lanes
- Removal or relocation of off-street or on-street parking spaces
- Adoption or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)
- Addition of traffic wayfinding signage
- Rehabilitation and maintenance projects that do not add motor vehicle capacity
- Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way
- Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve non-motorized travel
- Installation of publicly available alternative fuel/charging infrastructure
- Addition of passing lanes, truck climbing lanes, or truck brake-check lanes in rural areas that do not increase overall vehicle capacity along the corridor

1. Recommended Significance Threshold for Transportation Projects

As noted in Section 15064.3 of the CEQA Guidelines, lead agencies for roadway capacity projects have discretion, consistent with CEQA and planning requirements, to choose which metric to use to evaluate transportation impacts. This section recommends considerations for evaluating impacts using vehicle miles traveled. Lead agencies have discretion to choose a threshold of significance for transportation projects as they do for other types of projects. As explained above, Public Resources Code section 21099, subdivision (b)(1), provides that criteria for determining the significance of transportation impacts must promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses. (*Id.*; see generally, adopted CEQA Guidelines, § 15064.3, subd. (b) [Criteria for Analyzing Transportation Impacts].) With those goals in mind, OPR prepared and the Agency adopted an appropriate transportation metric.

Whether adopting a threshold of significance, or evaluating transportation impacts on a case-by-case basis, a lead agency should ensure that the analysis addresses:

- Direct, indirect and cumulative effects of the transportation project (CEQA Guidelines, § 15064, subds. (d), (h))
- Near-term and long-term effects of the transportation project (CEQA Guidelines, §§ 15063, subd. (a)(1), 15126.2, subd. (a))
- The transportation project's consistency with state greenhouse gas reduction goals (Pub. Resources Code, § 21099)[34]
- The impact of the transportation project on the development of multimodal transportation networks (Pub. Resources Code, § 21099)
- The impact of the transportation project on the development of a diversity of land uses (Pub. Resources Code, § 21099)

The CARB Scoping Plan and the CARB Mobile Source Strategy delineate VMT levels required to achieve legally mandated GHG emissions reduction targets. A lead agency should develop a project-level threshold based on those VMT levels, and may apply the following approach:

1. Propose a fair-share allocation of those budgets to their jurisdiction (e.g., by population);

[34] The California Air Resources Board has ascertained the limits of VMT growth compatible with California containing greenhouse gas emissions to levels research shows would allow for climate stabilization. (See *The 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Target* (p. 78, p. 101); *Mobile Source Strategy* (p. 37).) CARB's *Updated Final Staff Report on Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets* illustrates that the current Regional Transportation Plans and Sustainable Communities Strategies will fall short of achieving the necessary on-road transportation-related GHG emissions reductions called for in the 2017 Scoping Plan (Figure 3, p. 35). Accordingly, OPR recommends not basing GHG emissions or transportation impact analysis for a transportation project solely on consistency with an RTP/SCS.

2. Determine the amount of VMT growth likely to result from background population growth, and subtract that from their "budget";
3. Allocate their jurisdiction's share between their various VMT-increasing transportation projects, using whatever criteria the lead agency prefers.

2. Estimating VMT Impacts from Transportation Projects

CEQA requires analysis of a project's potential growth-inducing impacts. (Pub. Resources Code, § 21100, subd. (b)(5); CEQA Guidelines, § 15126.2, subd. (d).) Many agencies are familiar with the analysis of growth inducing impacts associated with water, sewer, and other infrastructure. This technical advisory addresses growth that may be expected from roadway expansion projects.

Because a roadway expansion project can induce substantial VMT, incorporating quantitative estimates of induced VMT is critical to calculating both transportation and other impacts of these projects. Induced travel also has the potential to reduce or eliminate congestion relief benefits. An accurate estimate of induced travel is needed to accurately weigh costs and benefits of a highway capacity expansion project.

The effect of a transportation project on vehicle travel should be estimated using the "change in total VMT" method described in *Appendix 1*. This means that an assessment of total VMT without the project and an assessment with the project should be made; the difference between the two is the amount of VMT attributable to the project. The assessment should cover the full area in which driving patterns are expected to change. As with other types of projects, the VMT estimation should not be truncated at a modeling or jurisdictional boundary for convenience of analysis when travel behavior is substantially affected beyond that boundary.

Transit and Active Transportation Projects

Transit and active transportation projects generally reduce VMT and therefore are presumed to cause a less-than-significant impact on transportation. This presumption may apply to all passenger rail projects, bus and bus rapid transit projects, and bicycle and pedestrian infrastructure projects. Streamlining transit and active transportation projects aligns with each of the three statutory goals contained in SB 743 by reducing GHG emissions, increasing multimodal transportation networks, and facilitating mixed use development.

Roadway Projects

Reducing roadway capacity (for example, by removing or repurposing motor vehicle travel lanes) will generally reduce VMT and therefore is presumed to cause a less-than-significant impact on transportation. Generally, no transportation analysis is needed for such projects.

Building new roadways, adding roadway capacity in congested areas, or adding roadway capacity to areas where congestion is expected in the future, typically induces additional vehicle travel. For the types of projects previously indicated as likely to lead to additional vehicle travel, an estimate should be made of the change in vehicle travel resulting from the project.

For projects that increase roadway capacity, lead agencies can evaluate induced travel quantitatively by applying the results of existing studies that examine the magnitude of the increase of VMT resulting from a given increase in lane miles. These studies estimate the percent change in VMT for every percent change in miles to the roadway system (i.e., "elasticity").[35] Given that lead agencies have discretion in choosing their methodology, and the studies on induced travel reveal a range of elasticities, lead agencies may appropriately apply professional judgment in studying the transportation effects of a particular project. The most recent major study, estimates an elasticity of 1.0, meaning that every percent change in lane miles results in a one percent increase in VMT.[36]

To estimate VMT impacts from roadway expansion projects:

1. Determine the total lane-miles over an area that fully captures travel behavior changes resulting from the project (generally the region, but for projects affecting interregional travel look at all affected regions).
2. Determine the percent change in total lane miles that will result from the project.
3. Determine the total existing VMT over that same area.
4. Multiply the percent increase in lane miles by the existing VMT, and then multiply that by the elasticity from the induced travel literature:

[% increase in lane miles] x [existing VMT] x [elasticity] = [VMT resulting from the project]

A National Center for Sustainable Transportation tool can be used to apply this method: https://ncst.ucdavis.edu/research/tools

This method would not be suitable for rural (non-MPO) locations in the state which are neither congested nor projected to become congested. It also may not be suitable for a new road that provides new connectivity across a barrier (e.g., a bridge across a river) if it would be expected to substantially

[35] See U.C. Davis, Institute for Transportation Studies (Oct. 2015) *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*; Boarnet and Handy (Sept. 2014) *Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions*, California Air Resources Board Policy Brief, available at https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf.
[36] See Duranton and Turner (2011) *The Fundamental Law of Road Congestion: Evidence from US cities*, available at http://www.nber.org/papers/w15376.

shorten existing trips. If it is likely to be substantial, the trips-shortening effect should be examined explicitly.

The effects of roadway capacity on vehicle travel can also be applied at a programmatic level. For example, in a regional planning process the lead agency can use that program-level analysis to streamline later project-level analysis. (See CEQA Guidelines, § 15168.) A program-level analysis of VMT should include effects of the program on land use patterns, and the VMT that results from those land use effects. In order for a program-level document to adequately analyze potential induced demand from a project or program of roadway capacity expansion, lead agencies cannot assume a fixed land use pattern (i.e., a land use pattern that does not vary in response to the provision of roadway capacity). A proper analysis should account for land use investment and development pattern changes that react in a reasonable manner to changes in accessibility created by transportation infrastructure investments (whether at the project or program level).

Mitigation and Alternatives

Induced VMT has the potential to reduce or eliminate congestion relief benefits, increase VMT, and increase other environmental impacts that result from vehicle travel.[37] If those effects are significant, the lead agency will need to consider mitigation or alternatives. In the context of increased travel that is induced by capacity increases, appropriate mitigation and alternatives that a lead agency might consider include the following:

- Tolling new lanes to encourage carpools and fund transit improvements
- Converting existing general purpose lanes to HOV or HOT lanes
- Implementing or funding off-site travel demand management
- Implementing Intelligent Transportation Systems (ITS) strategies to improve passenger throughput on existing lanes

Tolling and other management strategies can have the additional benefit of preventing congestion and maintaining free-flow conditions, conferring substantial benefits to road users as discussed above.

G. Analyzing Other Impacts Related to Transportation

While requiring a change in the methodology of assessing transportation impacts, Public Resources Code section 21099 notes that this change "does not relieve a public agency of the requirement to analyze a project's potentially significant transportation impacts related to air quality, noise, safety, or any other impact associated with transportation." OPR expects that lead agencies will continue to

[37] See National Center for Sustainable Transportation (Oct. 2015) *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*, available at http://www.dot.ca.gov/newtech/researchreports/reports/2015/10-12-2015-NCST_Brief_InducedTravel_CS6_v3.pdf; see Duranton and Turner (2011) *The Fundamental Law of Road Congestion: Evidence from US cities*, available at http://www.nber.org/papers/w15376.

address mobile source emissions in the air quality and noise sections of an environmental document and the corresponding studies that support the analysis in those sections. Lead agencies should continue to address environmental impacts of a proposed project pursuant to CEQA's requirements, using a format that is appropriate for their particular project.

Because safety concerns result from many different factors, they are best addressed at a programmatic level (i.e., in a general plan or regional transportation plan) in cooperation with local governments, metropolitan planning organizations, and, where the state highway system is involved, the California Department of Transportation. In most cases, such an analysis would not be appropriate on a project-by-project basis. Increases in traffic volumes at a particular location resulting from a project typically cannot be estimated with sufficient accuracy or precision to provide useful information for an analysis of safety concerns. Moreover, an array of factors affect travel demand (e.g., strength of the local economy, price of gasoline), causing substantial additional uncertainty. Appendix B of OPR's General Plan Guidelines summarizes research which could be used to guide a programmatic analysis under CEQA. Lead agencies should note that automobile congestion or delay does not constitute a significant environmental impact (Pub. Resources Code, §21099(b)(2)), and safety should not be used as a proxy for road capacity.

H. VMT Mitigation and Alternatives

When a lead agency identifies a significant impact, it must identify feasible mitigation measures that could avoid or substantially reduce that impact. (Pub. Resources Code, § 21002.1, subd. (a).) Additionally, CEQA requires that an environmental impact report identify feasible alternatives that could avoid or substantially reduce a project's significant environmental impacts.

Indeed, the California Court of Appeal recently held that a long-term regional transportation plan was deficient for failing to discuss an alternative which could significantly reduce total vehicle miles traveled. In *Cleveland National Forest Foundation v. San Diego Association of Governments, et al.* (2017) 17 Cal.App.5th 413, the court found that omission "inexplicable" given the lead agency's "acknowledgment in its Climate Action Strategy that the state's efforts to reduce greenhouse gas emissions from on-road transportation will not succeed if the amount of driving, or vehicle miles traveled, is not significantly reduced." (*Cleveland National Forest Foundation*, *supra*, 17 Cal.App.5th at p. 436.) Additionally, the court noted that the project alternatives focused primarily on congestion relief even though "the [regional] transportation plan is a long-term and congestion relief is not necessarily an effective long-term strategy." (*Id.* at p. 437.) The court concluded its discussion of the alternatives analysis by stating: "Given the acknowledged long-term drawbacks of congestion relief alternatives, there is not substantial evidence to support the EIR's exclusion of an alternative focused primarily on significantly reducing vehicle trips." (*Ibid*.)

Several examples of potential mitigation measures and alternatives to reduce VMT are described below. However, the selection of particular mitigation measures and alternatives are left to the discretion of

the lead agency, and mitigation measures may vary, depending on the proposed project and significant impacts, if any. Further, OPR expects that agencies will continue to innovate and find new ways to reduce vehicular travel.

Potential measures to reduce vehicle miles traveled include, but are not limited to:

- Improve or increase access to transit.
- Increase access to common goods and services, such as groceries, schools, and daycare.
- Incorporate affordable housing into the project.
- Incorporate neighborhood electric vehicle network.
- Orient the project toward transit, bicycle and pedestrian facilities.
- Improve pedestrian or bicycle networks, or transit service.
- Provide traffic calming.
- Provide bicycle parking.
- Limit or eliminate parking supply.
- Unbundle parking costs.
- Provide parking cash-out programs.
- Implement roadway pricing.
- Implement or provide access to a commute reduction program.
- Provide car-sharing, bike sharing, and ride-sharing programs.
- Provide transit passes.
- Shifting single occupancy vehicle trips to carpooling or vanpooling, for example providing ride-matching services.
- Providing telework options.
- Providing incentives or subsidies that increase the use of modes other than single-occupancy vehicle.
- Providing on-site amenities at places of work, such as priority parking for carpools and vanpools, secure bike parking, and showers and locker rooms.
- Providing employee transportation coordinators at employment sites.
- Providing a guaranteed ride home service to users of non-auto modes.

Notably, because VMT is largely a regional impact, regional VMT-reduction programs may be an appropriate form of mitigation. In lieu fees have been found to be valid mitigation where there is both a commitment to pay fees and evidence that mitigation will actually occur. (*Save Our Peninsula Committee v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 140-141; *Gentry v. City of Murrieta* (1995) 36 Cal.App.4th 1359; *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 727–728.) Fee programs are particularly useful to address cumulative impacts. (CEQA Guidelines, § 15130, subd. (a)(3) [a "project's incremental contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact"].) The mitigation program must undergo CEQA evaluation, either on the program as a whole, or the in-lieu fees or other mitigation must be evaluated

on a project-specific basis. (*California Native Plant Society v. County of El Dorado* (2009) 170 Cal.App.4th 1026.) That CEQA evaluation could be part of a larger program, such as a regional transportation plan, analyzed in a Program EIR. (CEQA Guidelines, § 15168.)

Examples of project alternatives that may reduce vehicle miles traveled include, but are not limited to:

- Locate the project in an area of the region that already exhibits low VMT.
- Locate the project near transit.
- Increase project density.
- Increase the mix of uses within the project or within the project's surroundings.
- Increase connectivity and/or intersection density on the project site.
- Deploy management strategies (e.g., pricing, vehicle occupancy requirements) on roadways or roadway lanes.

Appendix 1. Considerations About Which VMT to Count

Consistent with the obligation to make a good faith effort to disclose the environmental consequences of a project, lead agencies have discretion to choose the most appropriate methodology to evaluate project impacts.[38] A lead agency can evaluate a project's effect on VMT in numerous ways. The purpose of this document is to provide technical considerations in determining which methodology may be most useful for various project types.

Background on Estimating Vehicle Miles Traveled

Before discussing specific methodological recommendations, this section provides a brief overview of modeling and counting VMT, including some key terminology.

Here is an illustrative example of some methods of estimating vehicle miles traveled. Consider the following hypothetical travel day (all by automobile):

1. Residence to Coffee Shop
2. Coffee Shop to Work
3. Work to Sandwich Shop
4. Sandwich Shop to Work
5. Work to Residence
6. Residence to Store
7. Store to Residence

Trip-based assessment of a project's effect on travel behavior counts VMT from individual trips to and from the project. It is the most basic, and traditionally the most common, method of counting VMT. A trip-based VMT assessment of the residence in the above example would consider segments 1, 5, 6 and 7. For residential projects, the sum of home-based trips is called *home-based* VMT.

A *tour-based* assessment counts the entire home-back-to-home tour that includes the project. A tour-based VMT assessment of the residence in the above example would consider segments 1, 2, 3, 4, and 5 in one tour, and 6 and 7 in a second tour. A tour-based assessment of the workplace would include segments 1, 2, 3, 4, and 5. Together, all tours comprise *household* VMT.

[38] The California Supreme Court has explained that when an agency has prepared an environmental impact report:

> [T]he issue is not whether the [lead agency's] studies are irrefutable or whether they could have been better. The relevant issue is only whether the studies are sufficiently credible to be considered as part of the total evidence that supports the [lead agency's] finding[.]

(*Laurel Heights Improvement Assn. v. Regents of the University of California* (1988) 47 Cal.3d 376, 409; see also *Eureka Citizens for Responsible Gov't v. City of Eureka* (2007) 147 Cal.App.4th 357, 372.)

Both trip- and tour-based assessments can be used as measures of transportation efficiency, using denominators such as per capita, per employee, or per person-trip.

Trip- and Tour-based Assessment of VMT

As illustrated above, a tour-based assessment of VMT is a more complete characterization of a project's effect on VMT. In many cases, a project affects travel behavior beyond the first destination. The location and characteristics of the home and workplace will often be the main drivers of VMT. For example, a residential or office development located near high quality transit will likely lead to some commute trips utilizing transit, affecting mode choice on the rest of the tour.

Characteristics of an office project can also affect an employee's VMT beyond the work tour. For example, a workplace located at the urban periphery, far from transit, can require an employee to own a car, which in turn affects the entirety of an employee's travel behavior and VMT. For this reason, when estimating the effect of an office development on VMT, it may be appropriate to consider total employee VMT if data and tools, such as tour-based models, are available. This is consistent with CEQA's requirement to evaluate both direct and *indirect* effects of a project. (See CEQA Guidelines, § 15064, subd. (d)(2).)

Assessing Change in Total VMT

A third method, estimating the *change in total VMT* with and without the project, can evaluate whether a project is likely to divert existing trips, and what the effect of those diversions will be on total VMT. This method answers the question, "What is the net effect of the project on area VMT?" As an illustration, assessing the total change in VMT for a grocery store built in a food desert that diverts trips from more distant stores could reveal a net VMT reduction. The analysis should address the full area over which the project affects travel behavior, even if the effect on travel behavior crosses political boundaries.

Using Models to Estimate VMT

Travel demand models, sketch models, spreadsheet models, research, and data can all be used to calculate and estimate VMT (see Appendix F of the preliminary discussion draft). To the extent possible, lead agencies should choose models that have sensitivity to features of the project that affect VMT. Those tools and resources can also assist in establishing thresholds of significance and estimating VMT reduction attributable to mitigation measures and project alternatives. When using models and tools for those various purposes, agencies should use comparable data and methods, in order to set up an "apples-to-apples" comparison between thresholds, VMT estimates, and VMT mitigation estimates.

Models can work together. For example, agencies can use travel demand models or survey data to estimate existing trip lengths and input those into sketch models such as CalEEMod to achieve more

accurate results. Whenever possible, agencies should input localized trip lengths into a sketch model to tailor the analysis to the project location. However, in doing so, agencies should be careful to avoid double counting if the sketch model includes other inputs or toggles that are proxies for trip length (e.g., distance to city center). Generally, if an agency changes any sketch model defaults, it should record and report those changes for transparency of analysis. Again, trip length data should come from the same source as data used to calculate thresholds to be sure of an "apples-to-apples" comparison.

Additional background information regarding travel demand models is available in the California Transportation Commission's "2010 Regional Transportation Plan Guidelines," beginning at page 35.

Appendix 2. Induced Travel: Mechanisms, Research, and Additional Assessment Approaches

Induced travel occurs where roadway capacity is expanded in an area of present or projected future congestion. The effect typically manifests over several years. Lower travel times make the modified facility more attractive to travelers, resulting in the following trip-making changes:

- **Longer trips.** The ability to travel a long distance in a shorter time increases the attractiveness of destinations that are farther away, increasing trip length and vehicle travel.
- **Changes in mode choice.** When transportation investments are devoted to reducing automobile travel time, travelers tend to shift toward automobile use from other modes, which increases vehicle travel.
- **Route changes.** Faster travel times on a route attract more drivers to that route from other routes, which can increase or decrease vehicle travel depending on whether it shortens or lengthens trips.
- **Newly generated trips.** Increasing travel speeds can induce additional trips, which increases vehicle travel. For example, an individual who previously telecommuted or purchased goods on the internet might choose to accomplish those tasks via automobile trips as a result of increased speeds.
- **Land Use Changes.** Faster travel times along a corridor lead to land development farther along that corridor; that new development generates and attracts longer trips, which increases vehicle travel. Over several years, this induced growth component of induced vehicle travel can be substantial, making it critical to include in analyses.

Each of these effects has implications for the total amount of vehicle travel. These effects operate over different time scales. For example, changes in mode choice might occur immediately, while land use changes typically take a few years or longer. CEQA requires lead agencies to analyze both short-term and long-term effects.

Evidence of Induced Vehicle Travel. A large number of peer reviewed studies[39] have demonstrated a causal link between highway capacity increases and VMT increases. Many provide quantitative estimates of the magnitude of the induced VMT phenomenon. Collectively, they provide high quality evidence of the existence and magnitude of the induced travel effect.

[39] See, e.g., Boarnet and Handy (Sept. 2014) Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions, California Air Resources Board Policy Brief, available at https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf; National Center for Sustainable Transportation (Oct. 2015) *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*, available at http://www.dot.ca.gov/research/researchreports/reports/2015/10-12-2015-NCST_Brief_InducedTravel_CS6_v3.pdf.

Most of these studies express the amount of induced vehicle travel as an "elasticity," which is a multiplier that describes the additional vehicle travel resulting from an additional lane mile of roadway capacity added. For example, an elasticity of 0.6 would signify an 0.6 percent increase in vehicle travel for every 1.0 percent increase in lane miles. Many of these studies distinguish "short run elasticity" (increase in vehicle travel in the first few years) from "long run elasticity" (increase in vehicle travel beyond the first few years). Long run elasticity is larger than short run elasticity, because as time passes, more of the components of induced vehicle travel materialize. Generally, short run elasticity can be thought of as excluding the effects of land use change, while long run elasticity includes them. Most studies find a long run elasticity between 0.6 and just over 1.0,[40] meaning that every increase in lanes miles of one percent leads to an increase in vehicle travel of 0.6 to 1.0 percent. The most recent major study finds the elasticity of vehicle travel by lanes miles added to be 1.03; in other words, each percent increase in lane miles results in a 1.03 percent increase in vehicle travel.[41] (An elasticity greater than 1.0 can occur because new lanes induce vehicle travel that spills beyond the project location.) In CEQA analysis, the long-run elasticity should be used, as it captures the full effect of the project rather than just the early-stage effect.

Quantifying Induced Vehicle Travel Using Models. Lead agencies can generally achieve the most accurate assessment of induced vehicle travel resulting from roadway capacity increasing projects by applying elasticities from the academic literature, because those estimates include vehicle travel resulting from induced land use. If a lead agency chooses to use a travel demand model, additional analysis would be needed to account for induced land use. This section describes some approaches to undertaking that additional analysis.

Proper use of a travel demand model can capture the following components of induced VMT:

- Trip length (generally increases VMT)
- Mode shift (generally shifts from other modes toward automobile use, increasing VMT)
- Route changes (can act to increase or decrease VMT)
- Newly generated trips (generally increases VMT)
    - Note that not all travel demand models have sensitivity to this factor, so an off-model estimate may be necessary if this effect could be substantial.

However, estimating long-run induced VMT also requires an estimate of the project's effects on land use. This component of the analysis is important because it has the potential to be a large component of

[40] See Boarnet and Handy (Sept. 2014) *Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions*, California Air Resources Board Policy Brief, p. 2, available at https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf.

[41] Duranton and Turner (2011) *The Fundamental Law of Road Congestion: Evidence from US cities*, available at http://www.nber.org/papers/w15376.

the overall induced travel effect. Options for estimating and incorporating the VMT effects that are caused by the subsequent land use changes include:

1. *Employ an expert panel.* An expert panel could assess changes to land use development that would likely result from the project. This assessment could then be analyzed by the travel demand model to assess effects on vehicle travel. Induced vehicle travel assessed via this approach should be verified using elasticities found in the academic literature.
2. *Adjust model results to align with the empirical research.* If the travel demand model analysis is performed without incorporating projected land use changes resulting from the project, the assessed vehicle travel should be adjusted upward to account for those land use changes. The assessed VMT after adjustment should fall within the range found in the academic literature.
3. *Employ a land use model, running it iteratively with a travel demand model.* A land use model can be used to estimate the land use effects of a roadway capacity increase, and the traffic patterns that result from the land use change can then be fed back into the travel demand model. The land use model and travel demand model can be iterated to produce an accurate result.

A project which provides new connectivity across a barrier, such as a new bridge across a river, may provide a shortened path between existing origins and destinations, thereby shortening existing trips. In rare cases, this trip-shortening effect might be substantial enough to reduce the amount of vehicle travel resulting from the project below the range found in the elasticities in the academic literature, or even lead a net reduction in vehicle travel overall. In such cases, the trip-shortening effect could be examined explicitly.

Whenever employing a travel demand model to assess induced vehicle travel, any limitation or known lack of sensitivity in the analysis that might cause substantial errors in the VMT estimate (for example, model insensitivity to one of the components of induced VMT described above) should be disclosed and characterized, and a description should be provided on how it could influence the analysis results. A discussion of the potential error or bias should be carried into analyses that rely on the VMT analysis, such as greenhouse gas emissions, air quality, energy, and noise.

APPENDIX B

PROPOSED MITIGATION STRATEGIES FOR IMPLEMENTATION OF SB 743

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Proposed Mitigation Strategies for Implementation of SB 743

Categories	Mitigation Strategies	Proposed Language
Tier 1 - **On-Site Improvements**	**1.** Pedestrian Network Improvements **2.** Incorporate Bike Lane Street Design **3.** Provide Traffic Calming Measures **4.** Increase density **5.** Provide enhanced bicycle and/or pedestrian facilities **6.** Mixed-Use Overlay **7.** Incorporate affordable housing **8.** Bike parking for non-residential projects or multi-unit residential projects	**1.** Pedestrian Network Improvements shall be incorporated into a project site plan that provide pedestrian walkway access from a building entrance/exit to other buildings on the project site and a sidewalk that leads off-site.[1] **2.** Projects that include dedicated rights-of-way, non-dedicated roadways, or both, shall be designed at an appropriate width to accommodate, at a minimum, a painted on-street Bike Lane. [2] **3.** Traffic Calming Measures (TCMs) shall be incorporated into a project site plan, where applicable. [3] **4.** A density bonus will be allowed in conformance with Orange County Zoning Code. [4] **5.** Projects with existing bicycle and pedestrian facilities shall double the capacity of bicycle facilities (e.g., bicycle racks) and shall expand pedestrian walkway access such that all onsite buildings are interconnected and off-street connectivity is provided. **6.** A density bonus shall be allowed if a project includes both residential and employment land uses. **7**. A density bonus shall be allowed if a project includes affordable housing per the Zoning Code. 8. Bicycle parking shall be provided in a secure, enclosed location and be identified on a site plan. The bike parking shall be provided based on duration for non-residential developments. [5]

Proposed Mitigation Strategies for Implementation of SB 743

Categories	Mitigation Strategies	Proposed Language
Tier 2 - **Financial Incentives**	**9.** Project contributions to infrastructure improvement projects **10.** School pool program **11.** Subsidize vanpool for housing developments **12.** Provide car-sharing, bike-sharing or ride-sharing programs **13.** Provide subsidized transit passes	9. Should a program be adopted in the future, this will be an option for Applicants. [6] **10**. Each residential project would provide new homebuyers with a flyer describing the time and cost savings of carpooling. [7] **11**. Each residential project would provide new homebuyers or resale homebuyers with vouchers for each applicable commercial vanpool service for the period of time they own the home. [8] **12**. Each residential project would provide new homebuyers or resale homebuyers with flyers detailing the car-sharing, bike-sharing, or ride-sharing programs, documenting the time and cost savings of each. Non-residential projects would provide each employee with this flyer and post the flyer in a lunch room or break room location. [8] **13**. Each residential project would provide new homebuyers or resale homebuyers with transit subsidies for the period of time they own the home. Non-residential projects would provide each employee with access to transit subsidies. [8]

Notes:

1. The Pedestrian Network Improvements should provide intra-project connectivity and connectivity off-site.

2. A Class II bike lane represents a minimum standard. Class I off-street bike paths or Class IV bike boulevards could also be included and may result in greater usage and a greater reduction in VMTs.

3. TCMs are going to vary significantly among project types (residential v. commercial, etc.) and the size of the project envelope, and the types of TCMs that could be included. Project applicants should ensure measures are appropriate for the proposed project.

4. The density bonus in the Zoning Code applies to residential. However, appropriate measures may be applied to a non-residential project at the discretion of the County where VMT reduction may result.

5. In accordance with the 2019 California Green Building Standards Code for non-residential developments, short-term bicycle parking will require 5% of motorized vehicle parking spaces with a minimum of one two-bike rack. Long-term bicycle parking will require 5% of tenant-occupant vehicular parking spaces with a minimum of one bike parking facility.

6. The particular type of infrastructure project should be determined, as some would be more applicable than others. Also, the fee increment would have to be calculated.

7. Actual metrics on how much time and money would be saved should be provided that are specific to the project area.

8. Coordination would be the responsibility of the project applicant.

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